The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXIII, No. 18 CHICAGO, ILLINOIS OCTOBER 31, 1914

THE WEIR MITCHELL LECTURE

SURGICAL EXPERIENCES WITH PITUITARY DISORDERS *

HARVEY CUSHING, M.D.

BOSTON

Our variously acquired bits of information concerning the ductless gland disorders lie distractingly before us like the fragments of a modern picture puzzle. Here and there a few pieces, possibly on the basis of similarity of color, have been assembled and fitted together, but the relation of these groups to one another or to the design as a whole is not at all clear. Some of them subsequently prove to have been upside-down; marginal groups are found to belong at the side when they had been thought to go at the top; and the disappointing stage is always reached when pieces appear to have been irrevocably lost. A chance bystander with an eye for form picks up an odd piece, fits it into its proper place, and it immediately becomes apparent from the new outline that two isolated groups or foci of the picture can be articulated. So in the ductless gland puzzle, out of a jumble of fragments the pituitary group of pieces has come to be assembled; and though it is not quite complete in itself, nor is it quite clear where it will go in the finished picture, we at least know what it represents and which is top and which is bottom.

Thus while others were brooding over the thyroid and adrenal, Marie fitted together some oddly fashioned and disconnected pieces, and behold, acromegaly! Fröhlich fifteen years later made another symptomatic grouping of tumor, optic atrophy, adiposity and sexual infantilism; and though subsequently a few isolated pieces were marginally attached to each of these growing foci of the picture, it was not until the series of experiments with Crowe, Homans, Goetsch and Jacobson in the Hunterian Laboratory in Baltimore in 1908 and 1909 that Fröhlich's syndrome of dystrophia adiposogenitalis was observed to be wrong side up, for when reversed it fitted into Marie's fragment, making hypopituitarism and hyperpituitarism.[1]

During the six years which have since elapsed the clinical manifestations of pituitary disorders have been so widely discussed that physicians to-day are quick to recognize their constitutional expressions when full-blown, but as our acquaintance with these conditions progresses it becomes increasingly apparent that minor evidences of a functional glandular disturbance occur with considerable frequency but fail to cause comment of any kind. Indeed, in the ordinary walks of life beyond hospital walls outspoken examples, not only of acromegaly, but of the more newly appreciated syndrome of hypophysial insufficiency, are encountered sufficiently often to make us realize that a pronounced constitutional evidence of dyspituitarism in one direction or the other need not be incompatible with a reasonably comfortable and effective life or cause the victim to seek medical advice on the score of physical incapacitation.

When, however, a pituitary derangement, even of lesser grade, is accompanied by an extreme glandular enlargement, or when the secretory activity of the gland is impeded by the pressure of a suprasellar tumor, disturbing symptoms may arise of quite a different order from the constitutional expressions of the disease. Just so may a goitrous thyroid flatten the trachea and mechanically embarrass respiration, whether or not the struma is accompanied by symptoms of hyperthyroidism or hypothyroidism, or even in the absence of any appreciable endosecretory manifestations whatsoever. These local and neighborhood symptoms being essentially of a mechanical (pressure) nature call for mechanical (operative) means of relief; and the aspects of pituitary diseases which deal with the glandular enlargement or tumor will be made the main topic of this lecture. Naturally the experiences of a surgeon comprise a high precentage of cases of this order.

It may be recalled that much of our knowledge of pituitary disorders has revolved around the question of tumor—using the term in a comprehensive sense. It was the presence of a tumor which first led Marie, and subsequently Fröhlich, to couple with this comparatively obscure gland the syndromes which bear their names. And for the most of us to-day manifestations of tumor continue to be a necessary guide-post, so that those who venture to predict pituitary disease in their absence do so with misgivings and merely on the ground that similar constitutional symptoms have been known to arise in conjunction with a growth.

With all this stress upon the tumor and its local manifestations we must not overlook the fact that the constitutional indications of pituitary disease may bear little relation to the size of the lesion, for outspoken acromegaly may occur with but little enlargement of the gland, and the counterposed secretory state may accompany a primary glandular hypoplasia, so that tumor may not enter into the question at all. Con-

* This paper formed the basis of the eighth Weir Mitchell Lecture, before the College of Physicians of Philadelphia, Feb. 25, 1914. As delivered it was fully illustrated by composite lantern slides portraying the varied clinical types of dyspituitarism in the author's series, chief emphasis being laid on the sellar deformations, on the histologic character of the various lesions, and on the perimetric fields before and after the operation. As these illustrations are too numerous for reproduction in a single article, the address in its present form is largely reduced to the mere statistical consideration of the operative results.

1. The Hypophysis Cerebri: Clinical Aspects of Hyperpituitarism and of Hypopituitarism, THE JOURNAL A. M. A., July 24, 1909, p. 249.

versely, a surprisingly large tumor producing extreme distortion of the structures of the interpeduncular space may give insignificant and hardly appreciable clinical evidence of its presence.

So far as the endosecretory expressions of pituitary disease are concerned the subject is rendered increasingly complex as soon as we attempt to differentiate between the symptoms produced by the two lobes of the gland, for they have very different physiologic activities. It is possible that there may be an overaction or underaction of one lobe alone, or an overaction of one lobe associated with insufficiency of the other: and as in the case of the adrenal cortex versus the medulla, attempts have been made to disengage from the combined picture the symptomatology of a lesion confined to one or the other anatomic division.[2] Furthermore, additional complexity is added by the polyglandular nature of every ductless gland disorder, which in some cases is so apparent as to make it doubtful which of the endosecretory organs is primarily at fault.

As I have said elsewhere, I feel that our most helpful working basis accepts the now prevalent view that derangement of any one of these correlated glands leads to more or less evident disturbances in other members of the series, but with the qualification that a primary disorder of any individual gland or pair of glands, whether on the side of oversecretion (perversion?) or undersecretion, produces its own peculiar group of symptoms. With some of the resultant syndromes we are already familiar. For example, a primary pituitary insufficiency, whether of childhood or adult life, bears a certain resemblance in its constitutional manifestations to a thyroid insufficiency in an individual of corresponding age; yet the two conditions, even without a tell-tale glandular struma, are easily distinguished. The insufficiences of adrenal, parathyroid and pineal glands, of the islets of the pancreas, and of the interstitial cells of testis and ovary, likewise give rise to their own peculiar syndromes; and though we know little of the constitutional expressions of the reverse conditions, except in the case of the thyroid (exophthalmic goiter) and the pars anterior of the pituitary body (acromegaly), yet we have reason to believe that the recognition of corresponding states of primary overaction of the other glands will be forthcoming.

Fig. 1.—To show anatomic relation of structures concerned and illumination of operative field; also position of patient, with modified Sewell mouth-gag and tongue-elevator in place; sponge in retropharynx (no longer used); lip being elevated preparatory to making the sublabial incision.

So far as is now apparent, a functional hyperplasia of the pars anterior of the pituitary body stimulates tissue growth, chiefly apparent in the skeletal, cuticular and subcuticular tissues, but at the same time, as the feeding experiments of Goetsch would indicate, there is an excitatory effect on the reproductive apparatus, reflected on the secondary characters of sex.[3] Conversely, anterior lobe insufficiency should inhibit skeletal growth and sexual development. Little is known, on the other hand, of the consequences of functional hyperplasia of the posterior lobe. This portion of the gland appears to be more concerned with tissue metabolism, for when rendered inactive by disease or by compression, metabolic processes are checked; a high tolerance is acquired for carbohydrates, which are promptly stored as fat; there is drowsiness, insensitivity, slow pulse and respiration, with a lowered respiratory quotient, a subnormal temperature, low blood-pressure and so on. This complex of symptoms, as has been pointed out,[4] in some measure simulates the phenomenon of hibernation, a state in which the metabolic fires burn low, and one in which marked histologic changes have been shown to occur in the gland—changes which suggest a seasonal wave of physiologic inactivity.

A tendency to progress toward a state of relative glandular inactivity is apparent in most cases of pituitary disease. It is true that hyperpituitarism may be recovered from without subsequent hypopituitarism, but commonly symptoms of glandular insufficiency are

2. Concerning the Symptomatic Differentiation Between Disorders of the Two Lobes of the Pituitary Body, Am. Jour. Med. Sc., 1913, cxiv, 313.

3. The Pars Anterior and Its Relation to the Reproductive Glands, Proc. Soc. Exper. Biol. and Med., 1913, xi, 26.

4. Hibernation and the Pituitary Body, Proc. Soc. Exper. Biol. and Med., 1913, xi, 25.

in the course of time superimposed on those of outspoken acromegaly. Moreover, it is sometimes possible to recognize by radiographic studies slight evidences of antecedent acromegaly in individuals in whom present signs of hypopituitarism are the outstanding and conspicuous expressions of the disorder. It was an appreciation of this mixture of symptoms which made it seem advisable to adopt the term "dyspituitarism" to cover all types, though numerous examples, particularly of glandular insufficiency, lie unquestionably on the side of hypopituitarism from the outset.

Many symptoms of former etiologic obscurity, other than those of accelerated or retarded skeletal growth, are so often associated with dyspituitarism that when they occur in more or less isolated fashion a suspicion of pituitary disease is now aroused. This is particularly true of many forms of obesity; but it must be realized that there are lean as well as fat examples of pituitary disorder, as I shall have occasion to illustrate, and it may be recalled that emaciation has been shown experimentally to be a consequence of the administration of posterior lobe extracts over long periods. Other symptoms of moment are the hypophysial polyurias, which are thought by some to be the key to diabetes insipidus.[5] States of undue drowsiness, some of the psychoses,[6] disturbances in the sexual sphere, as amenorrhea or impotence, delayed or precocious puberty, likewise suggest in many cases a hypophysial influence and lead us to-day to scrutinize the patient for possible correlated secretory or neighborhood symptoms.

Fig. 2.—Anterior view of field with mouth-gag in position; also the small transverse Loewe-Halstead incision across the frenum. (In this and the following sketch the view of the parts is upright, the reverse of the operator's view during the procedure.)

These, to repeat, are among the constitutional symptoms due to changes in the secretory activity of the gland, and their treatment calls for glandular therapy, administered so far as may be possible, to offset the apparent insufficiency of one or the other pituitary lobes. Happily the results of glandular feeding are often as gratifying as in the case of thyroid insufficiencies, but I am doubtful whether the functional hyperplasias of early acromegaly, in the absence of neighborhood disturbances, should be attacked by a partial removal of the gland, as is practiced in exophthalmic goiter; for hyperpituitarism, as I have pointed out, tends more often to become stationary or even to pass over into the stage of glandular inactivity than does hyperthyroidism. Still, promising results have followed such procedures, and I have occasionally been led to make a fractional hypophysectomy in cases of acute acromegaly when the patients have been victimized by severe pituitary headaches from distention of the capsule—a surprisingly infrequent form of discomfort as a matter of fact, for even the hypertrophied sella of acromegaly readily gives way to pressure.

It is quite a different matter when pronounced neighborhood disturbances are present, whether or not they are accompanied by endosecretory evidences of the disease; and in a series of 148 cases[7] regarded as primarily hypophysial, 101 have shown definite local signs of pressure implication of structures in the immediate vicinity of the gland.

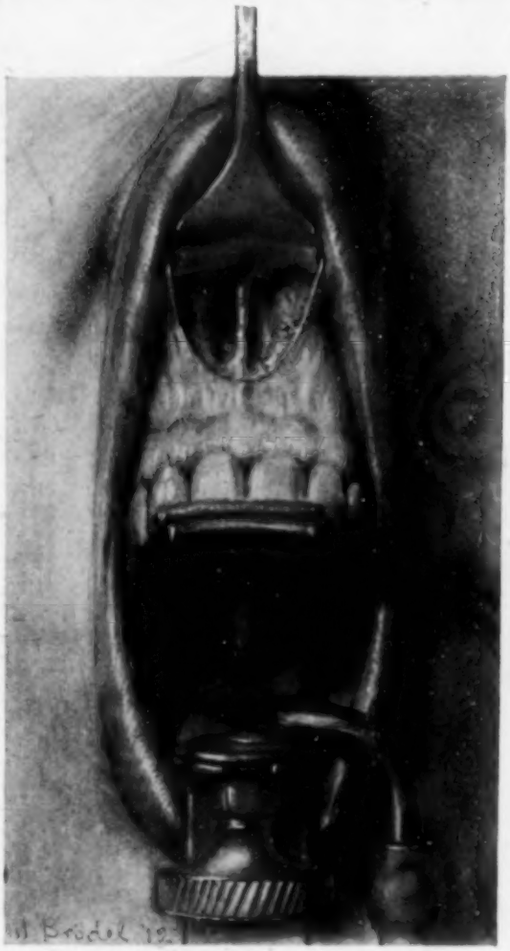

Fig. 3.—Exposure by blunt dissection of the lower edge of the cartilaginous septum. The mucous membrane is elevated from the septum to a considerable depth preparatory to the introduction of primary retractors.

I confess to the difficulty of satisfactorily classifying all of the examples of hypophysial disease of which I have records without running into too great complexity. I struggled with the subject rather ineffectually three years ago at the time of preparing a monograph on the subject, when there was much less material at hand to illustrate the varied types of dyspituitarism. Nevertheless it is necessary to give some idea

5. Concerning Diabetes Insipidus and the Polyurias of Hypophysial Origin, Boston Med. and Surg. Jour., 1913, clxviii, 901.

6. Psychic Disturbances Associated with Disorders of the Ductless Glands, Amer. Jour. Insan., 1913, lxix, 965.

7. At the time this lecture was delivered the series was limited to 136 cases. I have taken the liberty of bringing the statistics up to date (June 1, 1914) by including the cases observed in the succeeding four months.

of the character of the cases which are to be reviewed from the standpoint of surgical treatment, and for present purposes they may be divided into two groups —namely, the 101 cases presenting definite tumor manifestations and the forty-seven cases without these local signs of the disease.[8]

These 101 cases may be conveniently subdivided into the forty-eight cases in which the tumor has apparently arisen from some suprasellar source—usually from a congenital anlage—and the fifty-three cases in which an actual enlargement (struma) or tumefaction of the gland itself has served to call forth the local symptoms. Radiographic and perimetric studies are to be largely depended upon in distinguishing between these two

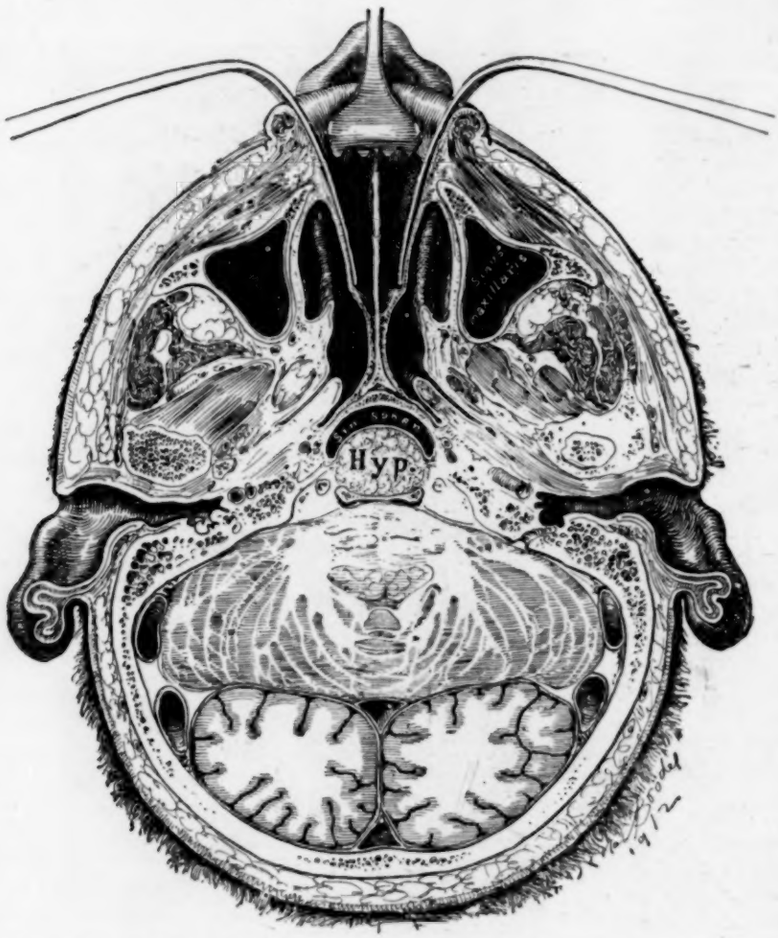

Fig. 4.—Horizontal section to show position of the lateral retractors introduced between the reflected mucous membrane and the denuded septum.

conditions, and it may be said in general of individuals manifesting neighborhood complications that those showing acromegalic tendencies usually represent cases of primary glandular (intrasellar), and those with adiposogenital dystrophic tendencies cases of supraglandular (or suprasellar), tumor. However, this rule is far from dependable, for exceptions arise, particularly in the large group possessing huge glandular strumas with insignificant signs of dyspituitarism. Moreover, a primary glandular struma may burst through the dural capsule and involve the chiasm and other interpeduncular structures without any very great enlargement of the sella; on the other hand, a superimposed tumor may wipe out the sellar outlines and cause blindness, simulating a primary glandular tumefaction were dependence to be placed solely upon the late x-ray diclosures.

Let us return for a moment to a further brief analysis of the 148 cases on the basis of their endosecretory or constitutional symptoms, irrespective of a tumefaction or otherwise of the gland or its environs. 1. The characteristic skeletal metamorphoses of acromegaly were apparent in forty-three cases. 2. The reverse clinical picture, namely, that of glandular insufficiency, was evident in ninety-four cases, some of them of the fat and some of the lean type, and almost all with more or less marked secondary genital dystrophy, though it must be acknowledged that in many, particularly the adult cases, the constitutional manifestations were so inconspicuous that they might have been overlooked had not pronounced neighborhood signs and symptoms been in evidence. 3. Finally, there occur in the series twelve cases of obvious polyglandular involvement, in which the hypophysis merely participates, without reasonable assurance that it is the primary source of the endosecretory disorder. In our present connection these three groups deserve further consideration, on the basis of the coexistent neighborhood disturbances—in other words, on the basis of the presence of symptoms which call for operative rather than medicinal therapy.

1. *Endosecretory Symptoms on the Side of Hyperpituitarism.*—In so far as its skeletal changes are concerned, acromegaly represents a permanent structural alteration, whether or not the secretory disorder which incites these alterations has ceased to be active. This is often a matter most difficult to determine, for doubtless, as in hyperthyroidism, the periods of activity of the process may occur in waves. Only when outspoken manifestations of glandular insufficiency are of long standing in cases in which there are coexistent skeletal evidences preceding acromegaly, is it safe to say that hyperpituitarism has permanently subsided. Of the 43 cases listed in the group of acromegalics (including 7 acromegalic giants), in 30 the typical features of this derangement were pronounced, whereas in 13, though unmistakable, they were far less evident, there being 4 examples in which traces of acromegaly would have been overlooked without roentgenologic studies.

Hence it is conceivable that in a still larger proportion of the patients an antecedent wave of hyperpituitarism may have occurred, though not sufficient to bring about any demonstrable fixed skeletal changes.

All of these cases in the acromegalic group showed sellar changes, varying from moderate enlargement of the fossa with the characteristic thickening of its walls to conditions of extreme distention. It is notable, however, that in only 20 of the 43 cases was any chiasmal

8. It should be noted in this connection that the mere enlargement of the sella, whether in association with acromegaly or otherwise, is not included among the so-called "neighborhood symptoms."

involvement demonstrable on perimetric tests at the time of admission, and moreover that these 20 cases, with but a few exceptions, were all ones in which a large struma had developed with coincident signs of pituitary insufficiency. Only one or two of the cases in the stage of advancing acromegaly showed deformations of the visual fields. Thus more than half of the patients in this the acromegalic group gave no outspoken neighborhood indications of tumor demanding operation, though it must be confessed that in one or two cases large unsuspected intracranial extensions of the struma which did not implicate the chiasm have been found post mortem.

In a number of these patients the polyglandular involvement was clinically apparent, for, in addition to the more common secondary disturbances on the part of the reproductive glands, they showed either coexistent goiters, or diabetes, or pigmentation with asthenia suggesting adrenal participation. However, in these cases the acromegalic changes were sufficient to overshadow the evidences of derangement of the other glands, and to stamp the condition as of primary pituitary origin.

In almost all of the cases subjected to operation the tissues removed proved to be more or less rich in acidophilic cells, whereas neutrophilic cells characterize the strumas of hypopituitarism.

2. *Endosecretory Symptoms on the Side of Hypopituitarism.* — This group possibly should include the 20 acromegalics spoken of above in whom there were distinct evidences of present glandular insufficiency. It will, however, in the present analysis be limited to the 94 cases in which the endosecretory manifestations appeared to be on the side of insufficiency from the outset. In 82 of these cases pronounced tumor symptoms were present. The 12 which were free from these neighborhood symptoms presented the typical constitutional picture of adiposogenital dystrophy, in association usually with an undersized sella. The absence of local symptoms naturally does not preclude the presence of a growth, for, as has been pointed out, the interpeduncular congenital lesions may be tolerated for years and may reach a considerable size before giving symptoms, but it is presumptive that the majority of the 12 cases represent a primary glandular hypoplasia without tumor.

The 82 cases with tumor may be grouped as follows: (1) 10 cases of adiposogenital dystrophy with tumor in which the onset of symptoms antedates adolescence —the typical syndrome of Fröhlich; (2) 8 cases of genital dystrophy with tumor but with extreme leanness rather than adiposity; (3) 63 cases in which the symptoms have arisen in adult life, often with retrogression of the secondary characters of sex, a more or less marked tendency toward the deposition of fat and invariably with pronounced neighborhood symptoms. As a matter of fact, however, in about half of these cases the constitutional evidences of hypophysial disorder were so relatively inconspicuous that without a localizing diagnosis the patients would readily have passed muster as normal (from an endosecretory standpoint) individuals.

In 29 of these 63 cases the lesion was of intrasellar origin—the so-called pituitary goiter or chromophobe struma, which in 4 instances had assumed malignant tendencies — and the radiographic outlines of the distended fossa were more or less completely obliterated. In the majority of the remaining 34 cases the lesion presumably arose from a suprasellar source, it having been certified in 15 cases as follows: developmental cystic tumor, 7; developmental solid (mixed) tumor, 6; endothelioma, 3; tuberculoma, 1. Though the existence of a retrochiasmal or suprachiasmal growth is reasonably certain in the 19 other cases, the diagnosis has not been assured by operation or necropsy.

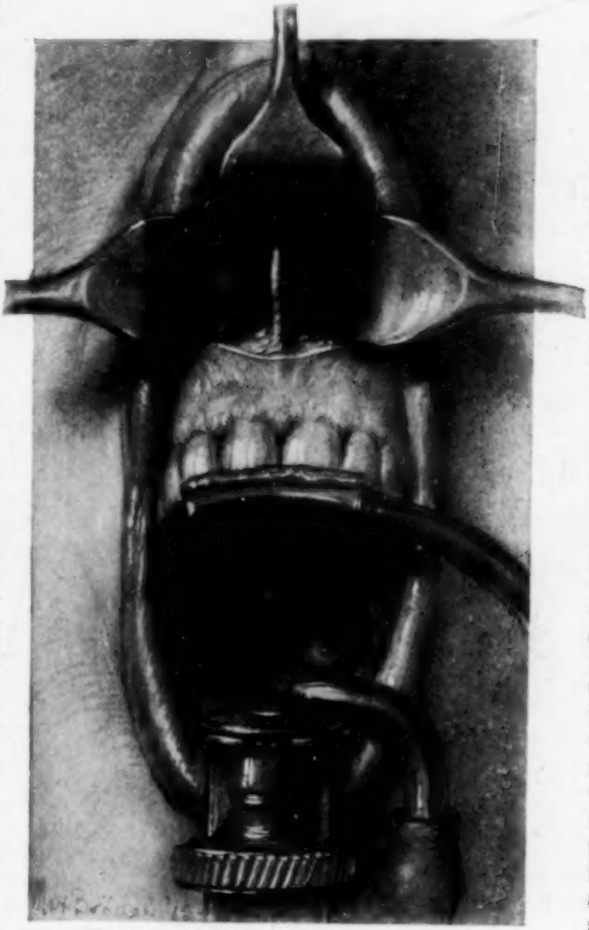

Fig. 5.—Anterior view of Figure 4 with primary lateral retractors in place before removal of septum.

3. *Endosecretory Symptoms of a Polyglandular Character.* — Here are included 12 cases with obvious pituitary implication but in which it is not apparent that an hypophysial disorder is the underlying element, unlike the cases of acromegaly mentioned above in which polyglandular manifestations are also clinically recognizable. They are cases in which a pineal, thyroid, adrenal, testicular or ovarian symptomatology is sufficiently pronounced to make a primary hypophysial disorder questionable. Three of these patients have been subjected either to a cranial exploration or decompression for relief of pressure symptoms, but their further consideration is beyond the scope of this report.

Perimetric Deviations.—The tumors or glandular strumas which accompany pituitary disease enlarge slowly, and symptoms may often be traced back for many years. Though as a rule the optic chiasm is the first of the neighborhood structures to suffer, it is extraordinary what a degree of stretching and displacement it is susceptible of without affecting the acuity of vision or causing any disturbance in the fields. The characteristic chromophobe struma originating in the gland itself may distend the sella to the point of absorp-

tion of its walls and stretch the glandular capsule until it gives way, permitting the enlarged gland to grow upward into the cranial chamber. Such an intracranial extension may occur to one side of or behind the chiasmal cross-roads, so that eventually either a homonymous or a bilateral defect in the fields of vision may be made out; but manifestations of pressure against the uncus, or against the crura, or even the frontal lobe, may give evidence of extensive intracranial invasion long before there are appreciable signs of chiasmal distortion.

Nevertheless, of all the local symptoms, evidences of pressure on the chiasm are of course the most characteristic and definite. Special studies of these chiasmal disturbances have been made with my co-worker Clifford B. Walker, and will be submitted elsewhere. It will suffice to say here that in the majority of the cases in which perimetric changes have been present, the defects in the fields of vision occurred in the upper quadrants, whether bitemporally or homonymously, indicating pressure against the chiasm from below. We have seen fit to speak of these field defects as grades or stages of hemianopsia, for true half vision, particularly when it affects both eyes symmetrically, is not only comparatively rare, but shows a seriously advanced stage of the process. In the earliest stage, which unhappily is not often recognized, there is merely a slanting off of the form field possibly in one eye alone, with a more or less definite quadrantal loss for colors and often a relative paracentral scotoma—to which de Schweinitz in an excellent paper on the subject has called attention. From the early defect of this Stage 1 the process advances in characteristic fashion through what we call Stage 4 of typical hemianopsia to Stage 8 in which blindness ensues. Moreover, on relief from pressure the process retraces its steps, occasionally with great rapidity—a matter of days oftentimes—until the fields are again normal, or as near normal as the stage of the advance will have permitted.

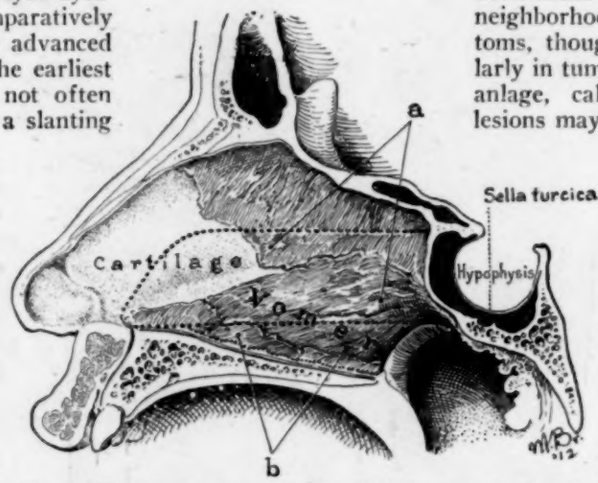

Fig. 6.—Diagram to show approximately the amount of septum removed, *a* being the necessary pathway, *b* being removed in addition, to insure orientation by keeping close to nasal floor. (Cartilage removed with Ballenger knife.)

We have had an unusual opportunity to observe all variations of advance and recession in the field defects and have concerned ourselves particularly with the early stages in patients with pituitary disease in whom evidence of chiasmal involvement has just begun to appear. There are, of course, bizarre forms of field defects—defects which begin at the lower quadrants, or as concentrically enlarging central scotomas, but these are rather more characteristic of the various superimposed lesions in which the visual cross-roads are more or less irregularly enveloped by the lesion. In the larger number of cases the condition progresses in the way which has been briefly described.

I need make no apology for this digression concerning the visual disturbances inasmuch as it is for their relief that operation is chiefly indicated, and a consecutive study of the field defects gives the best possible index, in the average case, of the efficacy of the procedure. Rarely in surgery do we have such a clearly measurable standard of the benefits of an operation.

Sellar Deformations.—Inasmuch as the surgical procedure best adapted for the relief of neighborhood symptoms hinges largely upon the radiographic disturbances of the pituitary fossa, it may not be out of place to comment briefly upon the several types of sellar distortion, though this is a special subject in itself. For our present purposes we need consider only three varieties: (1) the undeveloped sella; (2) the sella affected by superimposed pressure; (3) the sella distended by a primary glandular struma.

1. Abnormally small sellas or sellas with fused clinoids are frequently seen in cases of primary hypopituitarism without neighborhood symptoms. Not infrequently there is a coincident failure of full development of the sphenoidal cells, and the fossa may be perched on a comparatively solid sphenoidal base.

2. Sellas of approximately normal size but in a more or less abnormal position and with more or less irregular outlines often occur in conjunction with a superimposed tumor. Under these circumstances the diagnosis must usually hinge alone upon the neighborhood and constitutional symptoms, though occasionally, and particularly in tumors arising from a congenital anlage, calcareous depositions in the lesions may cast a radiographic shadow. Three examples of this occurring in my series have been recorded by Dr. Alfred Luger.[9]

3. The sellar enlargement accompanying glandular tumefaction is of two main types: (*a*) that occurring in simple acromegaly, in which bony thickening of the walls accompanies the distention, and (*b*) that in which progressive enlargement with thinning of the walls so deepens the fossa that it bulges into the sphenoidal cells and the thinned dorsum, if it persists at all, is represented merely by a scale of bone, showing as a thin line on the negative. Still even the thick walled fossa of acromegaly may undergo a similar degree of pressure atrophy in those cases in which there is an extreme enlargement of the gland.

These then are the main forms, though many deviations are met with, varying all the way from complete absence of any trace of the fossa except the anterior clinoid processes, to grades of flattening, of irregular bony thickening and so on, which require special interpretation. This may be difficult in the cases in which the pressure of a superimposed lesion has greatly deformed and flattened the fossa; and particular caution must be observed lest the sellar enlargement, due to distention of the third ventricle in conditions of internal hydrocephalus produced by a subtentorial tumor, be mistaken for a primary pituitary enlargement. This error is the more likely to occur in view of

9. Luger, Alfred: Zur Kenntniss der im Röntgenbild sichtbaren Hirntumoren mit besonderer Berücksichtigung der Hypophysengangsgeschwülste, Fortschr. a. d. Geb. d. Röntgenstrahlen, 1914, xxi, 605.

the signs of secondary hypopituitarism which often accompany hydrocephalus. Several cases of this kind have been referred to us with the diagnosis of primary pituitary disease; and needless to say, the performance, under this diagnostic error, of a transphenoidal operation with opening of the third ventricle would be disastrous.

For our present purposes the first form need not be further discussed. Examples of hypopituitarism with a small sella and no neighborhood signs are cases for glandular and not surgical therapy. From an operative standpoint we need consider only the second and third types when they occur in conjunction with neighborhood symptoms.

Operative Procedures for Suprasellar Tumors. — The chief difficulty arises when pronounced tumor symptoms, and possibly pronounced glandular symptoms as well, are associated with a sella of fairly normal configuration. How can the lesion be approached in these cases? Certainly not from below unless for the purpose of sellar decompression alone in the hope of improving the secretory capabilities of a flattened or compressed gland. In regard to this, however, I do not feel particularly hopeful, though a few remarkable examples of improvement from such a measure occurred in my earlier series. Obviously, if the lesion itself is to be attacked, some intracranial procedure is necessary, and two routes have been advocated: a lateral subtemporal route, practiced by Horsley and used by us in our canine experiments, and a frontal approach, first proposed by Hartley, Krause and McArthur and of late strongly advocated by Frazier and Elsberg.

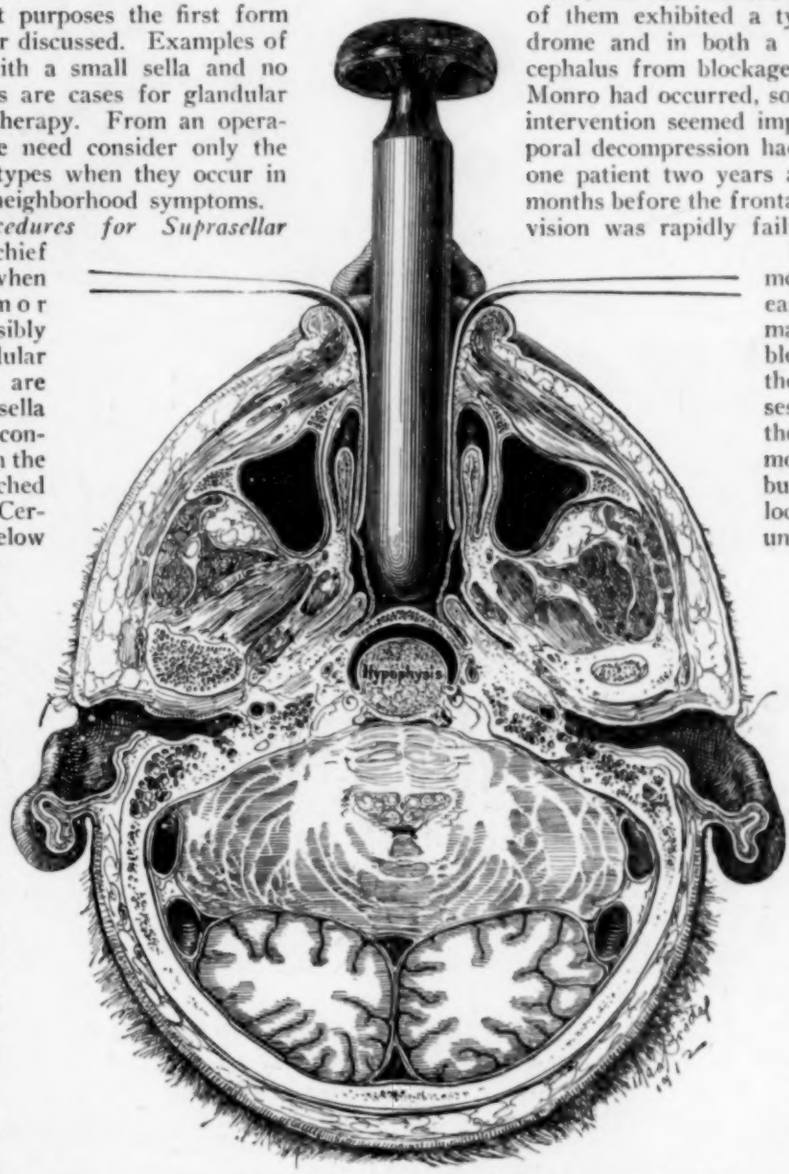

Fig. 7.—Horizontal section to show introduction between the retractors of one of a series of dilating plugs which serve to flatten the turbinates.

My own experiences have not been particularly happy with either of these measures. Subtemporal explorations have been made in eight instances. Great difficulty has been met with owing to tension, and only twice have I ventured to expose the dural margin of the fossa sufficiently well to justify fragmentary removal of the lesion. Unjustifiable laceration of the temporal lobe would have been produced had a more radical exposure been made. Such relief as these patients experienced was attributed to the cranial decompression, and consequently in the later series recourse has been had to this palliative measure alone for the larger number of these cases with an interpeduncular tumor.

My experience with frontal operations, likewise small, has been limited to five patients. Two of them exhibited a typical Frölich's syndrome and in both a complicating hydrocephalus from blockage of the foramina of Monro had occurred, so that some operative intervention seemed imperative. A subtemporal decompression had been performed in one patient two years and in the other six months before the frontal operation. In both vision was rapidly failing.

In each case a freely movable tumor was easily exposed, but its manipulation led to bleeding. In one of the patients at a second session some days later the growth was removed in its entirety, but with such extreme local damage that the unfortunate child's death twelve hours later was a blessing. In the second case the outcome would have been the same had I ventured to attempt a removal. Both of these growths were hard, calcified lesions, the one which was removed bringing with it a large cholesterin cyst the size of a golf-ball. Neither was capable of removal or partial removal piecemeal.

The three other cases were hardly more encouraging. All were adult patients with practically normal sellas but with nearly total blindness from primary optic atrophy. In two of them suprasellar cysts were found and evacuated—the condition supposedly most favorable for this type of operation. In one case vision had returned in each eye on the afternoon of the operation, but faded again after three or four days: the operation was repeated and an attempt made to permanently drain the cyst, with again a return of vision which failed after several days; on a third attempt the cyst was punctured by a "Balkenstich" and there was a slight return of vision after some days, which, however, was not permanent. In the two other cases the condition remained unchanged.

It is fair to say that this experience while discouraging is slight, and I shall further pursue the matter as favorable circumstances arise, but certainly the cases for which a frontal operation is indicated cannot compare, either in number or on the ground of risk or of promised improvement, with those to be discussed under the following heading in which a transphenoidal operation is suitable. It is conceivable that our diagnostic facility may so improve that we shall be able to recognize the presence of a suprasellar lesion before it has enlarged to any considerable extent; also that we may be able to foretell the presence of a cystic growth suitable for operative evacuation by this route; but judging from the post-mortem study of a number of these cases, few if any of them could have been benefited by a partial removal of the growth and its total removal would have been out of the question. Mere drainage, as the experience recounted above would indicate, will not always serve to give permanent results even in the case of a simple cyst.

Operative Procedures for Tumefactions Which Distend the Sellar Fossa.—The surgical story is here far more encouraging. In the analysis of 148 cases given above it was stated that neighborhood (usually chiasmal) symptoms accompanied by a greatly distended sella turcica were present in 20 of the acromegalics and in 29 of the patients with apparent primary hypopituitarism. Thus 49 cases in the series were clearly suitable for the transphenoidal procedure and almost without exception the 43 cases of the type which were subjected to operation have been greatly benefited. Some 25 other cases have been similarly treated, with less definite or with no improvement and, as the final statistics will show, with some fatalities.

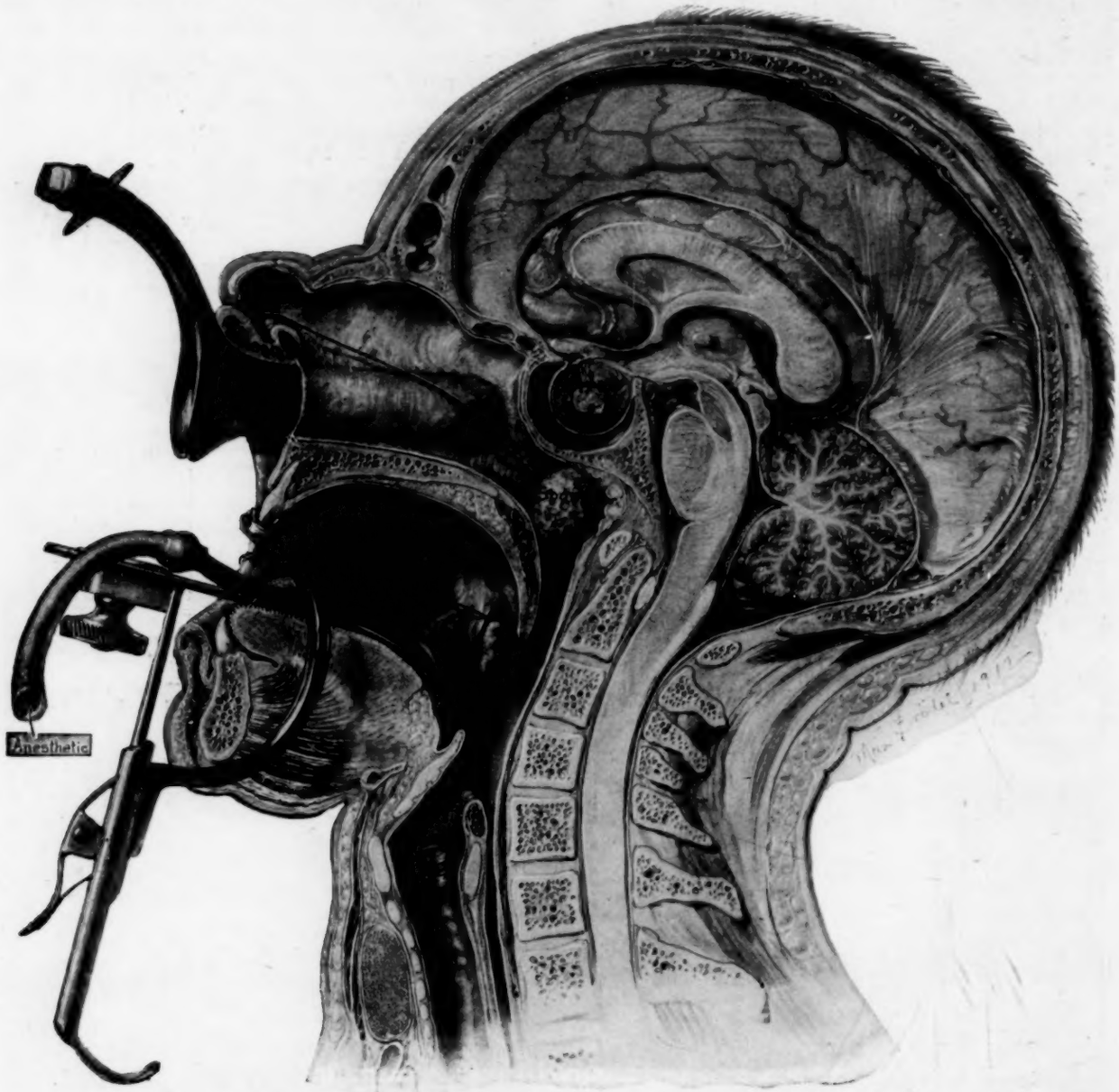

Fig. 8.—Sagittal section to show position of structures and substitution for the two lateral retractors of a self-retaining bivalve speculum through which the further manipulations are conducted.

The performance itself has been much simplified since the original transphenoidal operation which

Schloffer boldly originated. The procedure which I have come to employ is merely a composite of such modifications of the Schloffer operation, suggested by Kanavel, Halstead, Hirsch and others, as are adapted to my own requirements. It therefore makes no claim for originality.[10]

Few words in description of the operation are needed to supplement Mr. Max Brödel's drawings which are here reproduced, for, as is true of all his supurb medical illustrations, they serve to make the context superfluous. The sketches, however, were made two years ago, before my departure from Baltimore, and since then the operation has undergone some further simplification. At that time much reliance was placed upon the Sewell mouth-gag and tongue depressor, which with its leverage upon the upper teeth is admirably suited to hold the tongue forward—an important matter when, as in cases of acromegaly, there is considerable lingual hypertrophy. My anesthetist at that time, Dr. S. Griffith Davis, modified the apparatus by soldering a tube to the upper surface of the tongue depressor, so that the ether vapor could be conducted directly to the glottis, which the tongue depressor effectively holds open. Moreover, in the earlier operations tears were often made in the mucous membrane, with some leakage of blood into the pharynx, and to avoid this it was customary to occlude the posterior nares with a sea sponge, as shown in the drawings. Latterly, however, we have made use of Meltzer's intratracheal method, and with greater experience in conducting the submucous resection tears in the mucous membrane are usually avoided and we no longer need to occlude the posterior nares.

The operation combines all the advantages of the endonasal procedure of Hirsch, and for one who does not possess the practiced hand of the rhinologist it has the further advantage of affording almost double the room that an operation through one nostril permits. Furthermore, it possesses the advantage of a midline procedure, which affords almost as much operative space as was given in the earlier mutilating operations in which septum and turbinates were removed; for with the introduction of the dilating plugs the lower turbinates are temporarily flattened. By this method there is a complete avoidance of the postoperative ozena which, as von Eiselsberg points out, is one of the disagreeable consequences of exenteration of these structures.

When working at a depth in an operation of this kind the field must be absolutely dry, as identification of the structures at every bite of the rongeurs is essential. In the simple cases removal of the anterior wall of the sphenoidal cells exposes the bulging struma, which is often covered merely by mucous membrane and distended dural capsule, with possibly a few scales of the thinned sellar base between them. On slitting the coverings the soft struma extrudes from the incision and as much of the tissue as judgment permits is scooped out of the base of the sella by a blunt spoon.

10. A written comment on the operation may be found in "The Pituitary Body and Its Disorders," J. B. Lippincott Company, 1912, p. 297, *et seq.*

There are many helpful surgical devices, many precautions to be taken, many abnormalities which must be recognized, the discussion of which would lead too far at this time. One precaution alone may be mentioned, and this concerns the cases in which a superimposed tumor has distended and obliterated the sella, giving the radioscopic appearance of a primary sellar enlargement. Under these circumstances, on slitting the distended dura resistant tissue instead of the soft struma is exposed, and inasmuch as a flattened pituitary gland may be interposed between operator and tumor, it is well to remove a small snip of tissue for microscopic purposes and to postpone further progress by this route, if any is justifiable, for a subsequent session.

In the average case, however, there is no difficulty of interpretation; and after the extirpation of such of the

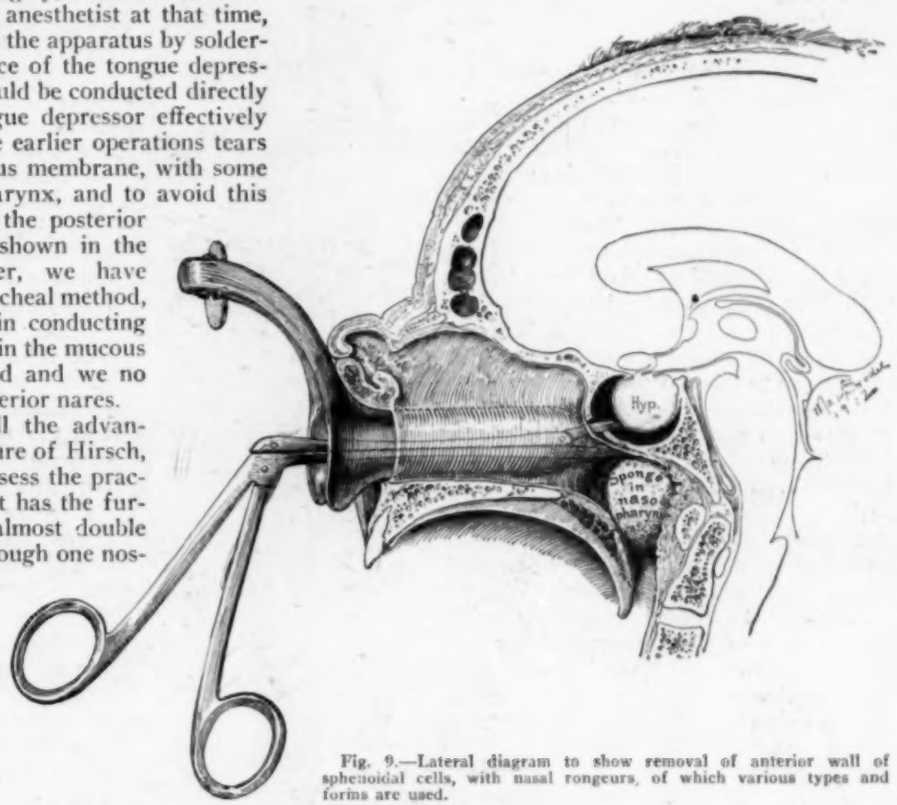

Fig. 9.—Lateral diagram to show removal of anterior wall of sphenoidal cells, with nasal rongeurs, of which various types and forms are used.

struma as seems wise the bivalve speculum which holds apart the intact mucous membrane linings of the septum is removed, a cigaret of gauze covered by petrolatumed protective is placed in each nostril, to hold the submucosal surfaces of the septum in approximation, and the sublabial incision is closed with two or three catgut sutures. As no drainage from the sphenoidal cells is used the raw gland must be left completely dry before withdrawal from the deep field. The cigaret plugs are removed after a few hours, and in many cases there is no subsequent discharge and it would be impossible to gather from a nasal examination that an operation had been performed. The patients are usually able to leave the hospital in a week or ten days.

The criterion of success, however, is not the getting in and out without risk or without a tell-tale of the operation, but the betterment of vision. Improvement is apt to be so abrupt in favorable cases in which the

temporal defect has not advanced beyond the stage of a midhemianopsia that patients are often aware of an increased acuity on recovering from the anesthetic. Even in cases of more advanced visual impairment improvement may follow, and in not a few cases vision has been regained in previously blind eyes, demonstrating, as I have elsewhere emphasized, that so-called primary optic atrophy with blindness need not represent a complete anatomic destruction of the nerve but rather a physiologic block to the transmission of light.

OPERATIVE STATISTICS

As already stated, in the series of 148 patients with evidences of a hypophysial derangement manifestations of tumor were present in 101 cases. In 95 of these cases surgical measures were undertaken. In a number of patients in the earlier series operations were attempted which experience has shown to have been unwise, and possibly these are offset by the number of favorable cases in the series that have refused operation. Hence it may be roughly estimated that about two-thirds of the individuals with outspoken pituitary disease suffer from defects of vision or from pressure discomforts capable of some measure of surgical relief.

The various types of operation, from the side, from in front, and from below, with their purpose, may be indicated as follows:

1. A *subtemporal decompression* for the sole purpose of relieving general pressure symptoms in case of a primary suprasellar tumor or of a growth arising from the gland itself which has extended into the cranial chamber.

2. A *lateral exploration of the interpeduncular region* with an osteoplastic resection, according to Horsley's method of approach under the temporal lobe.

3. A *fronto-orbital exploration*, after the method of McArthur, Frazier and others, to expose a suprasellar tumor, an operation which in the case of an irremovable lesion cannot be transformed into a decompression owing to its situation.

4. A *transphenoidal operation*, resulting in (*a*) a simple sellar decompression, or (*b*) a sellar decompression combined with partial removal of the intrasellar tumor.

Fig. 10.—View through speculum of operative field after removal of anterior wall of sphenoidal cells and floor of sella; showing primary nick in dural capsule to be enlarged by a knife-hook.

In not a few instances, as will be seen, two or more of these performances were carried out on the same patient, so that all told, on the 95 patients subjected to operation, 124 operations were performed.

1. A simple *subtemporal decompression* was carried out on 33 of the 95 patients and in 4 instances both sides were decompressed. There were two fatalities in the early series, both of which have been recorded in my monograph (Cases V and VIII). Of the remaining 31 patients about 20 were relieved of the coexistent general pressure symptoms. In a few instances there was an unexpected improvement in vision: one patient, for example, who was completely blind, with a primary atrophy, regained hemianopic vision in each eye. In 9 cases there was no apparent change subjectively or objectively, but it must be realized that in the greater number we were dealing with large tumors. In the 6 patients who suffered from uncinate attacks the decompression failed to modify this distressing symptom.

2. In 8 cases a *lateral osteoplastic resection combined with a subtemporal decompression* was carried out and an exploration was made below the temporal lobe to the point of exposure of the interpeduncular region, but in only one case was a partial removal of the growth possible. Though there were no fatalities the less difficult and dangerous decompression by itself would have accomplished as much for these individuals.

In 13 patients a subtemporal decompression or exploration was preceded or supplemented by another operation. Thus in 9 instances a transphenoidal operation had been previously or was subsequently carried out, and in 4 a fronto-orbital operation, and consequently for statistical purposes these cases are included in each operative group. All told therefore there were 45 subtemporal procedures, with the 2 operative fatalities which have been mentioned.

3. Our experience with *fronto-orbital operations* has already been related. All but one of the 5 cases had previously been subjected to a subtemporal decompression owing to pressure headaches, with relief in each case. Vision was not greatly impaired at the time of the palliative decompression in any of these cases, and the transfrontal operation was not undertaken until a later period (one year, six months, four months, two months). As recounted, one operative fatality occurred after the removal of a large tumor at a second-stage procedure. Another of the patients was operated on twice; hence there were 6 transfrontal operations, with one death. That they were difficult cases, not susceptible to prompt relief by customary measures, is shown by the fact that in the 5 cases there have been 15 operations, including the subtemporal decompressions, callosal and ventricular punctures, and the direct attacks on the growth itself.

4. Of the *transphenoidal operations* 74 have been performed on 68 patients—twice in 5 cases and in one instance a third time owing to the continued enlargement of the growth with return of chiasmal symptoms and a persistance of uncinate seizures. As already pointed out, in 9 of these cases a subtemporal decompression was also made.

In 16 cases a simple *sellar decompression* was performed, with slitting of the dura but with no tissue removal. This was purposeful in some instances: in others further progress was checked owing to bleeding from the surface of the tumor: in others it was inadvisable owing to a threatened leakage of cerebrospinal fluid: in still others impossible, for the reason that a flattened pituitary gland lay between the tumor and the operator. In one or two of these cases of simple

decompression, in lieu of tissue removal, a radium tube has been inserted into the substance of the struma and withdrawn after a few hours.

These cases therefore represent some of the more difficult experiences in some of the earlier operations, and the three deaths from meningitis which occurred in this series all followed misdirected operations in cases of this type with a small sella and superimposed tumor. Another patient recovered after a severe meningitis.

In 52 patients a *sellar decompression combined with extirpation* of tissue or evacuation of a cyst has been carried out 58 times. In these 58 operations there have been 4 operative fatalities: 1 after a primary partial removal of a sellar struma in the case of an acromegalic who had a large intracranial extension of the growth which was unsuspected but which should have been recognized; 2 others after a second attempt to partially remove a large suprasellar tumor from below; and the fourth after a third transphenoidal operation as related. The post-mortem examination in all four of these cases showed that operative relief by the route chosen was utterly impossible and that they were cases suited only for a subtemporal decompression. Thus in the 74 operations in this transphenoidal group there have been 7 fatalities (9.5 per cent.), all but one of them occurring in the earlier series.

The results of the transphenoidal operation, which, as has been made clear, is carried out chiefly for the relief of chiasmal involvement, have been most gratifying in the 61 survivors in the 68 cases. Progressively failing vision has become stationary or has been slightly regained over periods varying from a few months to several years in 22 cases. There has been a prompt widening of the fields with marked improvement of vision, often with return to the normal, in another 22 cases. In 2 patients vision was temporarily made worse as a result of the operation, but there was subsequent great improvement. Though vision had been completely lost in 5 cases before the operation, in 2 of the cases it was partially regained. In 8 cases it was unaffected before the operation, and still remains so. In only 3 cases was there a progressive failure of vision despite a successful operation and in all of them the tissues removed showed a malignant transformation of the lesion to which the patients have since succumbed.

The entire operative series for the 95 patients may be tabulated as herewith, 19 of them having been subjected to a decompressive craniectomy in addition to the direct attack on the tumor.

TABULATION OF OPERATIVE SERIES

	Cases	Operations	Fatalities
Subtemporal decompressions	33	37	2
Subtemporal explorations	8	8	0
Subfrontal explorations	5	6	1
Transphenoidal decompressions ...	16	16	3
Transphenoidal extirpations	52	58	4
	114	125	10

Thus there was a total operative mortality of 8 per cent. and a case mortality of 10.5 per cent. Moreover, in the 74 operations in the two transphenoidal groups there have been 7 fatalities (9.5 per cent.), most of them occurring in the earlier series.

Thus in these 95 patients there have been 125 operations, with 10 fatalities—8 in my earlier Baltimore series of 74 operations (10.8 per cent.), 2 in my subsequent Boston series of 50 operations (4 per cent.), showing a lowering of the mortality with a wider experience.

That these mortality figures can be further improved with increased familiarity in the proper selection of cases and with perfected operative methods is evidenced by the fact that in the last 33 transphenoidal operations there has been only one death, this having occurred in the case of the patient in whom, as recorded, a third operation was unwisely undertaken.

Statistics are dreary matters but it is periodically incumbent upon us to assemble our cases not only for our own instruction lest we bury in obscurity our mistaken and bad results, but also to acquaint others with the standing of operative measures.

We have become confronted of late years with new surgical problems relating to a group of patients with disorders which were unrecognized by our forebears, and hesitating as our steps may be in meeting these problems our operative experiences must from time to time be recorded in all their lights and shadows.

The Peter Bent Brigham Hospital.

TWO NEW METHODS OF CLOSURE OF THE PYLORUS FOR PYLORIC AND DUODENAL ULCER*

ALFRED A. STRAUSS, M.D.
CHICAGO

Closure of the pylorus for pyloric and duodenal ulcer has been recognized more and more in recent years as of the greatest importance in the cure of pyloric and duodenal ulcer. Prominent among the investigators and surgeons who have demonstrated various methods are Kelling, who, in 1900, used a silk ligature, and Parlavecchio, who, in 1910, used a ligature of cotton and wool, which was tied around the pylorus only tight enough to bring the mucous membrane into apposition. This was insufficient in both man and animals, the ligature cutting through, leaving the lumen of the pylorus the same as before operation. In addition, patients operated on by this method suffered severe gastric pain. Bier modified this method by crushing the portion of the stomach where the ligature was placed. He claimed that these patients have no pain. Closure is not complete, but adequate clinically. In 1913, at the German Surgical Congress, he stated that he is dissatisfied with all methods of closure, and now has returned to the use of the simple ligature, by simply infolding the ulcer with sutures, after the method of Moynihan. This is not a complete closure, but it suffices. Mayo and Moynihan used the puckering-string method. The ligature passes only through the muscularis, in order to infold the mucosa. Both here and in England good results have been obtained by this method. Küttner and Körte have both had success and failure, and in animals no lasting stenosis is accomplished.

Körte used puckering sutures both on the anterior and posterior walls, whenever possible. If perigastric adhesions are present, then it suffices to place them in the anterior wall only. This does not give a complete closure, as is shown on the cadaver by passing the finger into the stomach after ligatures are applied.

Girard and Doyen performed a pyloroplasty at right angles to the usual direction, which narrows instead of

* Additional illustrations appear in the author's reprints.
* From the Department of Experimental Surgery of the Morris Institute of Medical Research of the Michael Reese Hospital.

widening the lumen. They cut down to the mucosa only. Propping reported failures by this method.

Bogoljuboff and Wilms used the fascia lata and anterior sheath of the rectus. This method seemed an improvement over all other methods. Wilms had used it in twelve cases at the time of the German Surgical Congress in 1913. The patients had no blood in the

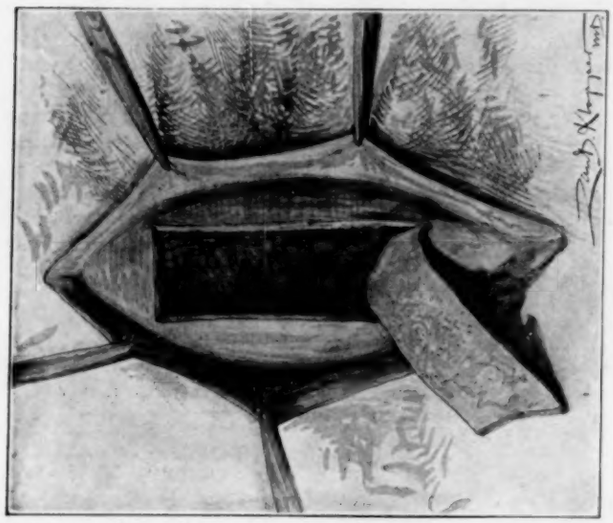

Fig. 1.—First method of pyloric closure. Anterior sheath of rectus exposed and flap resected.

stools and no pains. The Roentgen ray showed closure to be complete, the stomach emptying itself in one hour. In three other cases Wilms used omentum. These were also reported as successful. Siegel, however, reports a complete failure by this method, and after two months no trace of the fascia was demonstrable. Bier reports a case of enormous scar formation and perigastritis by this procedure.

Brewer used an aluminum band 1 cm. in width and 5 cm. in length. This was placed around the pylorus

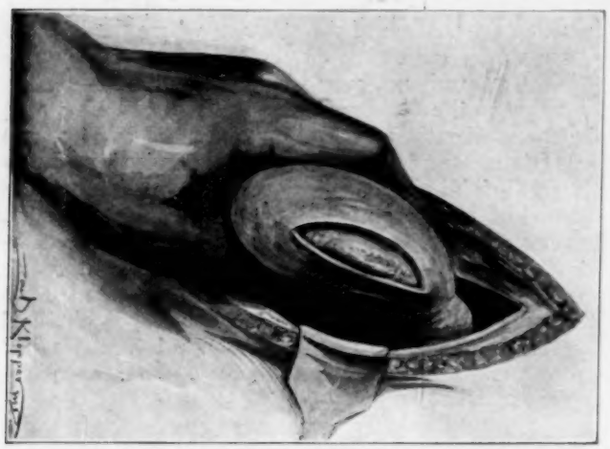

Fig. 2.—Incision in stomach to pyloric sphincter, exposing mucosa.

and rolled snugly with the fingers to produce sufficient compression to obliterate the lumen. He reported experiments on nine animals, the oldest of which was 9 weeks, in which the pylorus was closed.

Bartlett divided the muscular coats and mucosa by means of a metal skewer. This is thrust directly through both walls of the stomach into the lesser peritoneal cavity, and out again. A clamp is placed behind the skewer and several mattress sutures introduced between skewer and clamp. This embraces the whole thickness of both walls of the stomach. The skewer is cut out with a sharp knife and the mattress sutures tied. A hemostatic running stitch of silk or linen unites the four exposed cut edges. The ridge of tissue formed by the mattress sutures is inverted with a continuous Lembert row.

Von Eiselsberg's unilateral exclusion of the pylorus is the most exact method. It would be recommended in all cases were it not a relatively long operation, producing a great deal of shock. The exclusion is a larger operation than the gastro-enterostomy itself, and almost impossible to perform when dense adhesions are present. Henle, who otherwise recommends it, lost 16.65 per cent. with exclusion, versus 6 per cent. with gastro-enterostomy alone. A fair number of cases of fatal hemorrhage have been reported following this operation.

While I was carrying on my work, Biondi published, in October, 1913, a method of pyloric closure. The first step, which is shelling out the membrane, is prac-

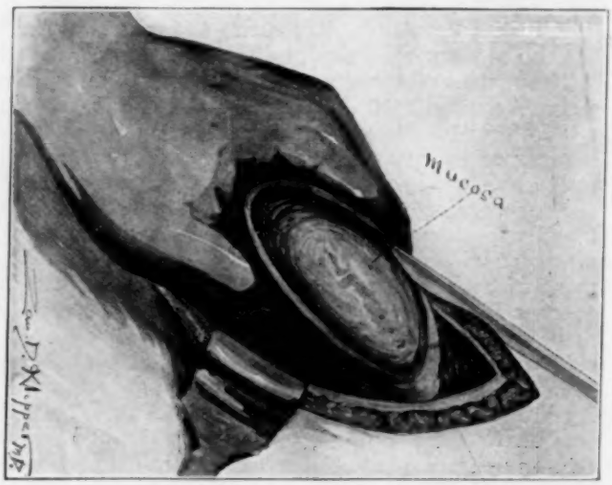

Fig. 3.—Method of freeing mucosa.

tically the same as one of the methods to be described here, but the second step, producing closure, is entirely different, both in method and in principle. He divides the shelled-out membrane, making a closed cuff at each end with sulk sutures.

It will be noticed from the foregoing that the methods can be divided into two great classes: First, those which attempt to close the pylorus by bringing the mucosa into apposition with ligature, puckering string, fascia and metal band. Second, those which divide the mucosa alone or mucosa and muscularis. The ligature method is bound to fail at all times, because no ligature can be buried, especially near the pylorus, where the peristaltic waves are most powerful. The ligature produces an anemic necrosis, and sloughs inward toward the lumen of the bowel. I believe there are two important factors which explain this. First, the force of the action of the peristaltic wave of the stomach is toward the central portion of its lumen; consequently any ligature or object which produces an anemic necrosis will be forced inward. The intra-abdominal pressure possibly is a factor. We know that in the normal collapsed stomach intra-abdominal

pressure far exceeds the pressure within the gastric cavity. This gives additional force to bodies in the wall of the stomach, causing them to be forced in the direction of least resistance, namely, its lumen.

Placing fascia around the muscularis of the pylorus has the disadvantage of having to overcome the powerful peristaltic contractions, the occurrence of adhesions and the possibility of absorption.

The second class, which divides the mucous membrane or mucous membrane and muscularis, has a fair amount of success. The ligatures which close the mucosa slough inward, as is well known in gastro-enterostomy. If this occurs at both divided ends at the same time, it leaves a communication. It is also a well-established fact that all physiologic tubes — stomach, bowel, ureter, common bile duct — if given the slightest chance, have an inherent tendency to reestablish their mucous lining and lumen.

Taking advantage of the above facts, that the mucous membrane of the stomach, when divided, has a tendency to reestablish its lumen, and that ligatures are always forced toward the lumen of the bowel, I tried to keep this work within the limits of the following principles: First, the closure must be accomplished without division of the mucous membrane, but rather a closure produced by connective tissue contractions, such as one finds in the stricture of the bowel and hour-glass stomach. Second, the operation should be a simple one, which can be done in a short time, so as not to add too much additional shock to the necessary operation of gastro-enterostomy.

Fig. 4.—Muscularis everted, mucosa lying on its surface.

AUTHOR'S FIRST METHOD

With the above facts in mind the following surgical procedure was carried out:

A right rectus incision was made ½ inch to the right of the midline, extending from the angle of the ribs down to the umbilicus. The anterior sheath of the rectus was exposed and a flap resected, ¾ by 1½ inches (Fig. 1). In resecting this a thin, adherent layer of muscle fibers from the rectus muscle was taken with it. The stomach was next brought into view. The pyloric portion was then tightly grasped between the thumb and index finger. An incision was then made proximal to the pyloric sphincter on the upper outer surface 1½ inches in length (Fig. 2). This exposed the mucosa. Two strokes with the scalpel on each side, between the mucosa and muscularis, freed the mucosa sufficiently (Fig. 3), so that the thumb could be placed under the pylorus and, grasping the edge of the muscularis, the entire muscularis could be everted (Fig. 4), so that the mucosa lay on the everted muscularis like a rubber tube. This step is the most important one. Without eversion it is next to impossible to separate the mucosa from the muscularis without tearing it. It can now be easily separated with a sharp scalpel. There is only a small amount of oozing of blood.

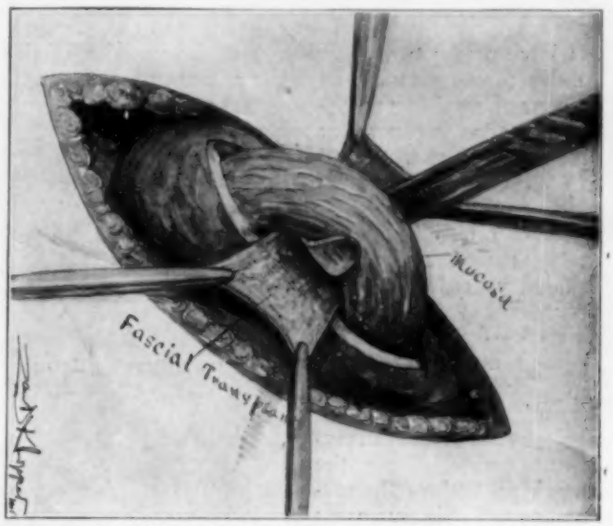

Fig. 5.—Free fascial transplant from rectus placed around mucosa.

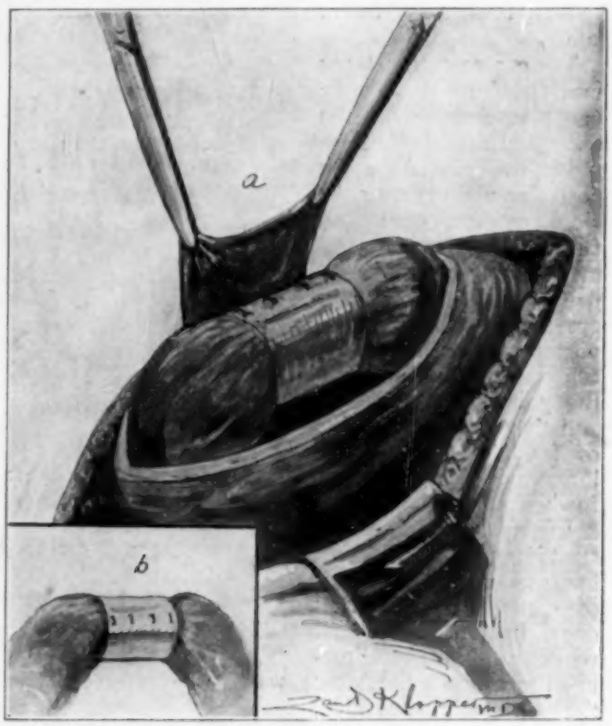

Fig. 6.—*a*, End of transplant sutured to mucosa and traction being made to cause collapse of mucosa; *b*, final suturing of end of transplant. Note double suturing.

The free fascial transplant of the rectus was placed around the mucosa (Fig. 5). One end of this transplant was sutured with four interrupted sutures to the mucosa (Fig. 6, *a*); on the other end traction was made, which collapses the mucosa and rotates it about one-eighth of a turn on its longitudinal

axis. This aids in making it a complete closure. The end of the transplant was sutured with four interrupted sutures to the surface of the attached portion, just tightly enough to hold it in a collapsed condition, and a third continuous suture holding down the edge (Fig. 6, *a*).

The mucosa was now replaced in its normal position within the muscularis and was closed by continuous interlocking sutures, as in Figure 7, two of the sutures catching the fibrous band so that it cannot slide forward and backward on the inner surface of the muscularis.

I have performed this closure at the junction of the fundus of the stomach with the antrum pylori as well as near the sphincter pylori, in order to show that ulcers in the antrum pylori as well as duodenal ulcers could be shut off by this method. The suture material used was No. 2 braided waxed silk. The procedure takes fifteen minutes—five minutes for shelling out the mucosa, five for placing on the transplant and three to five for closing the musculature. In seven cases the anterior sheath of the rectus was used; in five cases the transversalis fascia, muscle and peritoneum and in four cases fascia lata.

The gastro-enterostomy was performed in the usual manner, with the exception that the anastomosis was placed on the posterior wall as near the closed pylorus as possible. It seems when the anastomosis is made at the most dependent portion of the greater curvature, on the posterior wall, the stomach empties quickly up to the point of anastomosis and then leaves a residue of food between the pylorus and the anastomosis for hours.

In August, 1913, I first started on this procedure, but, owing to an epidemic of distemper, almost all dogs operated on died within a few days following the operation. After the epidemic subsided, sixteen dogs were operated on by the above procedure, and practically all of them made uneventful recoveries. None of the dogs vomited following the operation, and all were placed on a full diet within six days. They all appeared in perfect health and many of them gained in weight. At the end of two months the first animal was roentgenographed and fluoroscoped and then killed. The roentgenogram showed the pylorus absolutely closed and the gastro-enterostomy working. In this dog the closure was performed at the junction of the antrum pylori and fundus of stomach. Necropsy showed the stomach and pylorus perfectly free. On examining the pylorus one would not know that the operation had been performed on it. The stomach was removed, the gastro-enterostomy clamped off, and the esophageal end of the stomach attached to a hydrant. Under enormous hydrostatic pressure not a drop of water could be forced through the pylorus. The pylorus was sectioned and the water test again performed, with the same result. The cross-section of the closed pylorus (Fig. 8) showed the mucosa firmly collapsed. Around it, the free transplant could be distinctly seen attached to the mucosa on one side, and on the other side to the muscularis. The muscularis appeared perfectly normal.

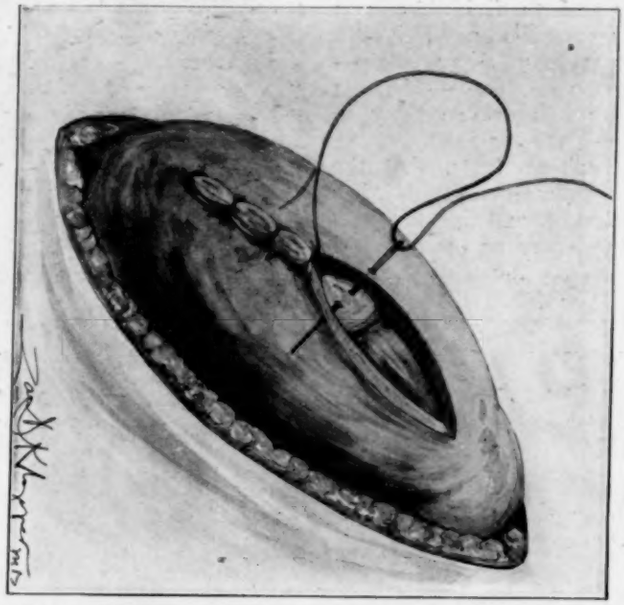

Fig. 7.—Mucosa replaced in normal position and closed by interlocking sutures. Note catching of fibrous band in sutures to prevent slipping.

Fig. 8.—Cross-section of closed antrum of the pylorus. From a photograph. *A*, mucosa; *B*, fascial transplant holding mucosa; *C*, muscularis of pylorus; *D*, blind fold of mucosa at upper end of closure outside of fascial transplant.

Histology. — Complete cross-section (Fig. 9) of the pylorus shows the mucosa normal and collapsed, with no sign of pressure atrophy in any portion of it. Around it is seen the fascial transplant perfectly organized and containing many small blood-vessels attached to the mucosa. The striated muscle fibers from the rectus also appear normal, still retaining their nuclei. The muscularis is attached to the fibrous transplant, and shows no changes.

In Figure 10 is shown a section of the fibrous band under high power. The glands of the mucosa appear normal. The fascia is intimately connected to the latter. In it are many blood-vessels and nuclei. The muscle fibers of the rectus sheath also appear to be normal.

At the end of four months six animals were killed. The changes were the same as noted above. All of them showed an absolutely water-tight pylorus. Three of the dogs had a few web-like adhesions from the sutures of the pylorus to the under surface of the liver. At the end of five months four more were killed, with the same findings. At the end of six months two more were killed, with the same findings. In one of these the closure was made proximal to the sphincter pylorus, and the transplant used was peritoneum, transversalis fascia and transversalis muscle. On cross-section the mucosa is collapsed and around it can be seen the fascial band. The muscularis appears normal. Histologic examination shows, on complete cross-section, that the peritoneum had disappeared and little could be seen of the transversalis muscle, but the white fibers of the transversalis fascia seemed to be perfectly organized, as in the specimen described above.

My reason for taking this particular transplant of peritoneum, transversalis fascia and muscle was that my recent work on artificial ureter[1] made from this particular transplant showed a complete metaplasia, the fascia being transformed into a bony plate. No such metaplasia occurred when placed around the mucosa of the pylorus, showing that the metaplasia which did occur was due to the chemical constituents of the urine.

Fig. 9.—Cross-section of portion of pylorus shown in Fig. 8. From a photomicrograph × 5.5; A, collapsed mucosa; B, fascial transplant around mucosa; C, muscularis; D, blind fold of mucosa.

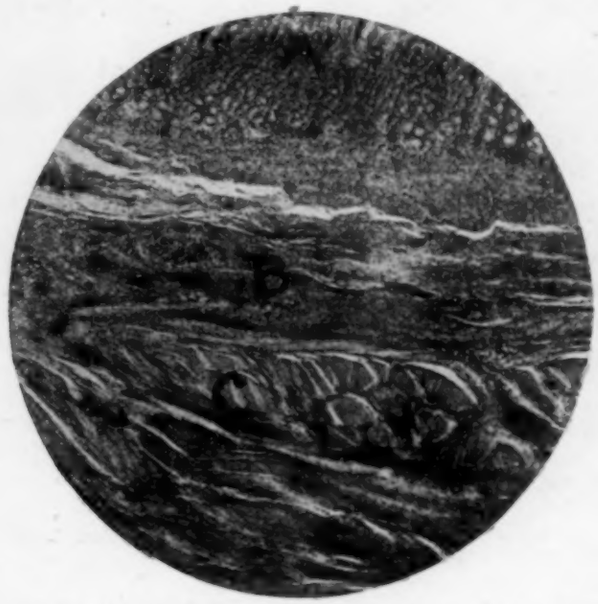

Fig. 10.—Section of portion of pylorus shown in Fig. 8. From a photomicrograph; A, mucosa; B, connective tissue of transplant; C, muscle fibers of transplant.

AUTHOR'S SECOND METHOD

The second or silk-ribbon method was based on two facts: (1) ordinary ligatures cut through the pyloric musculature, and (2) fascial transplants placed around the pylorus have a tendency to give way under the powerful peristaltic contractions. Furthermore, these transplants become adherent to adhesions or disappear entirely. To overcome these obstacles a piece of ordinary white silk ribbon ¾ inch in width was sterilized. A closed Kocher forceps was passed beneath the pylorus through the mesentery. The forceps was next opened to enlarge the mesenteric opening and the ribbon pulled through (Fig. 11, *a*). One end of the ribbon was sutured with four interrupted sutures to the muscularis, as in Figure 11, *b*. The other end was sutured to the ribbon with four interrupted sutures, and the edge with continuous sutures (Fig. 11, *c*). The sutures near the antrum pylori were not placed as tightly as those near the sphincter pylori. The effect was funnel-shaped, thus preventing the abrupt cutting off of the peristaltic waves. The ribbon sutured in this manner was just tight enough to place the mucosa in apposition. The tissues covering the ribbon contract down on it still tighter, making the closure still more complete. This method is very simple and takes only five minutes.

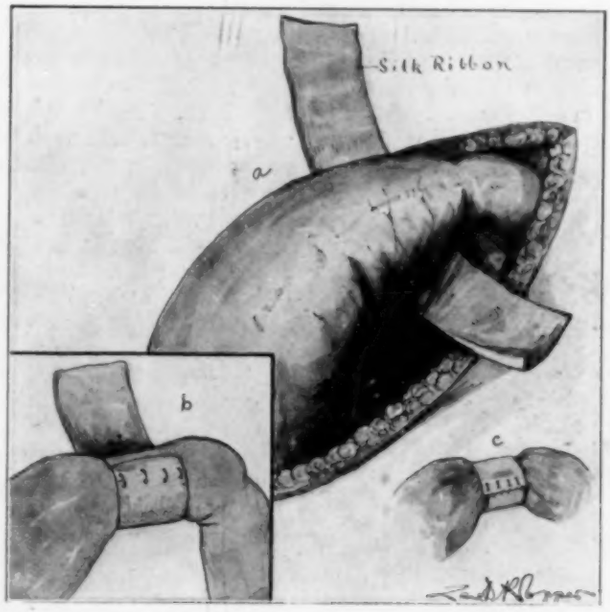

Fig. 11.—Silk ribbon method; *a*, ribbon pulled through mesenteric opening; *b*, end of ribbon sutured to muscularis; *c*, final suturing of ribbon.

Twelve dogs were operated by the above method. One animal tore open its abdomen at the end of one week. Another died of peritonitis, the cause of which could not be ascertained. The other ten made uneventful recoveries. At the end of five days one dog was killed. The tissues from the lesser omentum had covered the ribbon completely, as in Figure 12. At the end of four weeks one dog was killed, showing the same findings. At the end of two months four more dogs were killed, with the same findings. In one of these the ribbon was placed more tightly than usual, and cut only a small way into the tissues. At the end of five and one-half months three more animals were killed. In these the ribbon was covered by a glazed, transparent tissue, as in Figure 13. The pylorus in two was perfectly free, while in the third quite dense adhesions were formed between the pylorus and the liver. All of these stomachs were put to the water test, and the pylorus found absolutely closed.

1. Strauss, A. A.: Surg., Gynec. and Obst., January, 1914.

In six additional dogs a rubber ribbon was used instead of silk ribbon, the rubber being impregnated with 15 per cent. sulphur. All of these animals, with the exception of one, died in from five to eight days following operation, the constant contractile power of the rubber cutting through the pylorus. One animal lived, and was killed at the end of two months. It showed the same results as with the silk-ribbon

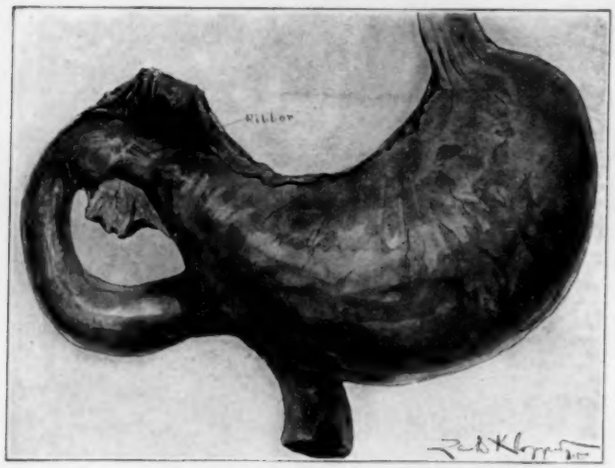

Fig. 12.—Stomach from dog killed five days after operation. Ribbon completely covered by tissues from lesser omentum.

method, only here under high pressure the pylorus was not water-tight.

CONCLUSIONS

1. In the sixteen dogs operated on by the submucous transplant method, the pylorus was water-tight under hydrostatic pressure, and as shown by fluoroscope and roentgenogram. The free fascial transplant became organized with the mucosa and muscularis in every instance, producing sufficient contraction to hold the pylorus closed without producing

Fig. 13.—Stomach from dog killed five and one-half months after operation. Ribbon covered by glazed transparent tissue.

any necrosis of mucosa. This I believe is due to the fact that the connective tissue used is placed under a tension similar to what it would be in the anterior sheath of the rectus.

2. The free transplant placed between the mucosa and muscularis has the advantage of not having to overcome the powerful peristaltic contractions of the pyloric musculature, and is not subject to the formation of adhesions and inflammatory changes, as a transplant placed around the musculature of the pylorus would be.

3. The method of shelling out the mucosa is safe, in that there is no danger of hemorrhage from large vessels, and less danger from infection, as in the methods by which the mucosa has to be divided.

4. The silk-ribbon method, while it is very simple and produces a perfect closure, and while the number of experiments seems to show it to be a fairly safe method, has the objection of having a large foreign body buried. Of the two methods the transplant method is by far the one of choice. The rubber method I would consider dangerous and a failure.

I want to thank Dr. E. Kirk of the Morris Institute of Medical Research for the valuable advice he has given me while carrying on this work, and Miss Wilton who assisted me in the operative technic.

30 North Michigan Boulevard.

THE RESULTS IN ONE HUNDRED OPERATIONS PERFORMED ON THE DIAGNOSIS OF BRAIN TUMOR*

HERMANN KÜTTNER, M.D.
Professor of Surgery, Schlesische Friedrich-Wilhelms-Universität
BRESLAU, GERMANY

The firm confidence with which the experienced surgeon of the present day approaches the solution of the problems set before him suffers a severe setback when these involve the operative treatment of brain tumors. True, we frequently read of single successful operations, but the infinite measure of our failures becomes apparent only in a few larger statistics. In no other domain of surgery are we so much at the mercy of the treacherous patient. None of us have been spared annoying surprises and numerous disappointments. And yet, when we glance back at what has been achieved at operations performed on the diagnosis of brain tumor, we need not abandon ourselves to too pessimistic a view of our accomplishments. We should always bear in mind that, without operation, the patients progress toward a terrible fate —excruciating headaches, epileptic attacks, paralysis, and chiefly, steadily advancing blindness which renders life no longer worth the living for these unfortunates. And here we find the explanation why we never encounter serious difficulties in obtaining the consent to operation on the part of the patients themselves, or of their relatives, although they have been made familiar with its dangers.

The results of operations for brain tumor will always depend on the certainty of diagnosis and the peculiarity of each particular case. The relatively large number of our decompressions demonstrate that impossibility of localizing the process, or of determining its extent, only too often frustrates radical operation and, with it, a permanent result. Much could be improved if brain-tumor suspects were only brought under competent neurologic observation early in the disease. I am very well aware of the difficulties of a diagnosis of brain tumor in the beginning of the affection.

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

We, too, are in a position to consider the diagnostic brain puncture of Neisser and Pollak as a great step forward, and its slight danger must not weigh too heavily against its great advantages. More particularly, we should not overestimate the danger of hemorrhage. At the necropsies in two cases I was able to note that the median meningeal artery had avoided the puncturing needle and that in another case the needle had perforated the transverse sinus without causing a hemorrhage. Still, I have occasionally observed a direct rise of pressure in connection with brain puncture which necessitated immediate operation. From this I draw the lesson that diagnostic brain puncture should be performed only under conditions which permit immediate trepanation, should this become necessary.

The diagnostic brain puncture also enables us to exclude an operation as futile in some cases, namely, when pathologic products can be demonstrated through punctures far apart. Thus, only recently I was able to demonstrate glial proliferations in a little girl, the suspected host of a tumor of the temporal lobe, through puncture into the frontal lobe as well as into the temporal fossa. In view of the extent of the process a radical operation would have been beyond the scope of possibility, but, in addition, exact histologic study showed these glial proliferations to be reactive in character rather than elements of a genuine tumor. I was gratified to note that as the result of conservative treatment all symptoms, including choked disk, materially subsided.

Occasionally definite tumor symptoms with focal phenomena may also be present without any space-reducing process at all. Bonhoeffer and I have seen such a case in which there was choked disk and other symptoms pointing to a left-sided tumor of the frontal brain. Yet, at the trepanation only a softening focus was found, which, as could be demonstrated at necropsy, had developed gradually on the basis of an arteriosclerosis.

In contrast thereto, I unexpectedly encountered a tumor in a woman, aged 31, who was admitted to the clinic with posttraumatic convulsions. Observation disclosed cortical epilepsy arising from the left facialis region, but no tumor symptoms. Excision of the facial center was done, and its microscopic examination suggested reactive glial proliferations. At the operation, however, the surroundings had appeared suspicious of tumor, and at the second operation a true glioma which diffusely infiltrated the depth was removed as far as possible. This was the only one of my cases in which even the symptom of headache was absent.

That very large tumors may develop with relatively slight symptoms, especially in the domain of the central region, I was able to observe repeatedly, while it is generally assumed that tumors in this region produce the classical symptoms very early. This is probably true only of tumors situated close to the surface; those deeper down may attain considerable dimensions without furnishing phenomena of diagnostic significance.

Some time ago I successfully excised such a subcortical tumor of the size of a man's fist—a fibrosarcoma of the right central region—in a male patient from Manila. Notwithstanding the size of the tumor, choked disk developed only a few days before operation, almost under my very eyes, more marked on the affected side than on the normal.

Generally speaking, I have frequently seen more marked, occasionally also only unilateral, choked disk on the same side as the tumor, but I do not believe that any definite conclusions may be drawn from this as to the localization of the tumor, since the reverse has also occasionally been observed. Absence of choked disk was noted in five cases.

Palliative trepanations which I had to perform over the central region or in its neighborhood, for instance, in disease of the posterior frontal or temporal brain, were in some cases followed by annoying contralateral paresis or complete paralysis. This annoying complication, experienced also by many other operators, in some of the cases subsided in the course of a few weeks; in other cases, however, improvement, as compared with the phenomena developing immediately after operation, unfortunately does not take place. Measures of prevention, such as two-stage procedure, a very large bone defect, smoothing of the edges of the bone defect, covering them with flaps from the dura, etc., did not succeed in averting the unpleasant complication when the pressure was so great that when the dura was opened, the brain was immediately forced into the gap. This contralateral paresis was observed with special frequency in inoperable gliomas.

Repeatedly decompression was not successful, namely, in cases in which even approximate localization was impossible. When, for example, in disease of the posterior cranial fossa, the decompression defect is placed over the cerebrum and vice versa, the designed relief (collateral drainage) is not obtained. In such doubtful cases it might possibly be well to decompress simultaneously above and below the tentorium, which is possible from an area in the occiput. Two opposing door-wing flaps of the dura are formed with the transverse sinus as a temporary base.

I have seen nothing that is gratifying from puncture of the corpus callosum and ventricular drainage. True, my material in this respect is rather small. But since in one case at necropsy seven weeks after puncture of the corpus callosum the opening was found completely healed, and in another case eight weeks after operation it could no longer be found at all, I am averse to continuing the employment of this measure, especially since palliative trepanation has rendered excellent service, notably in cases of chronic hydrocephaly.

As regards the technic of trepanation for brain tumor, I have departed from the formerly preferred one-stage operation and have become an adherent as a matter of principle of the two-stage procedure, even in palliative trepanations, unless acute symptoms of brain-pressure demand immediate opening of the dura.

The introduction of local anesthesia with 0.5 per cent. solutions of novocain-suprarenin has, in my clinic too, been welcomed as a great advance. One can always operate on the sitting patient, respiration is free and under easy control, and no special hemostasis is necessary for the scalp. In sensitive patients an ostensible narcosis is introduced which, however, remains so superficial that conversation can be carried on with the patient. I now employ full narcosis with ether only in exceptional cases, and then prophylactic hemostasis is attained by means of Makkas' clamps, which with us have displaced the back-stitching suture of Heidenhain.

For the cerebrum osteoplastic flaps are made. I formerly used mostly electrically-driven instruments —Doven's burr, Borchard's excellent plow and

Sudeck's fraise. But since this rather complicated instrumentarium has very often failed to work, I have now again returned to the employment of hand-drills, Dahlgren's forceps, or Gigli saw. After the flap has been divided on three sides, the bone is slightly grooved at the base and then broken across with the aid of two raspatories. The splitting of the dura is done in various ways, forming one large, or two door-wing, flaps, or with cross-incisions.

In the posterior cranial fossa preservation of bone is always dispensed with, because the breaking across of the flaps is here not devoid of danger and the periosteum as well as the powerful muscles at the back of the neck offer sufficient protection. In one case, in which the osteoplastic method was employed in the posterior cranial fossa, on injection of the local anesthetic for the second operation, respirations suddenly ceased. Evidently the injected fluid had forced the lower edge of the bone flap against the upper portion of the medulla oblongata, thus causing the alarming paralysis of respiration. This was fortunately relieved by long-continued artificial breathing.

Among the 104 surgical interventions performed at the Breslau clinic on 100 patients within the past six and one-half years, we succeeded in removing the tumor in 30 instances. In addition, the presence of a tumor was later demonstrated in 34 cases. Three cases proved to be tuberculous meningitis. In the remaining cases the tumor symptoms were traced back to hydrocephalus, the residues of hemorrhages, etc. In a few patients who died and on whom no necropsy was obtained, the cause of the disease could not be definitely ascertained.

Forty-five patients died as a result of the operation and its complications; F. Krause, too, who probably disposes of the largest material in Germany, has an operative mortality of about 50 per cent.; von Eiselsberg's mortality is 38 per cent. Twenty-four of the patients operated on are positively known to be living. Of those who survived the operation and its complications:

14 died in from 1 to 3 months
5 died in from 4 to 5 months
3 died in from 6 to 8 months
2 died in from 9 to 12 months
2 died after 1 year and 3 months
1 died after 1 year and 6 months
1 died after 2 years and 6 months

Among the patients operated on there are still living:

6 less than 6 months after operation
3 less than from 8 to 10 months after operation
1 less than 1 year after operation
2 less than 1¼ years after operation
1 less than 1½ years after operation
3 less than from 2 to 2¾ years after operation
6 less than from 3 to 4 years after operation
2 less than from 5 to 6 years after operation

Among these twenty-four survivors there are two tumors of the hypophysis, one tumor of the base of the frontal lobe, one of the parietal lobe, two tumors of the cerebellopontine angle and three tumors of the central region. In thirteen cases no tumor was found.

Of these twenty-four patients eleven may be considered cured for more than six months to six years; only two remain uninfluenced in their disease, while the remaining show, some of them very considerable, improvement.

Four of the cured patients had become totally blind before operation, and these had good vision restored to them later.

It should be emphasized here that even among the conservatively treated cases, in which there was suspicion of a brain tumor, in three cases complete recovery was achieved. Before the German Surgical Congress of the year 1913, Oppenheim, whose great experience in this domain commands the admiration of all of us, has sought to warn against too great a tendency for operation, referring to the good results achieved with conservative treatment. So prominent a neurologist as Oppenheim will certainly often be in a position to find the indications for an expectant attitude justifiable, and we surgeons are always dependent as a last resort on the advice of the neurologist and chiefly of the experienced ophthalmologist. Too long a delay, however, when choked disk is present, could scarcely be justified.

Examining, for the purpose of comparison, statistics of conservatively treated brain tumors, we find in the compilation of Bonhoeffer that among 63 cases observed in his clinic 26 patients were operated on and that 26 died in his clinic without operation, while 11 patients have withdrawn from further treatment. Among the patients who were treated in my clinic without operation, 58.8 per cent. also have died within six months. Of the remaining, either nothing at all is known, or the operation was declined by us on account of uncertainty of diagnosis—a course justified by later events.

The results to be expected after operations performed on the diagnosis of brain tumor may by no means be designated as absolutely bad from the results reported, when we bear in mind that the host of a brain tumor in every instance faces death after the most horrible suffering. The beneficent influence of decompression, more particularly in cases of chronic hydrocephalus, on restitution of vision, encourages and urges also early surgical procedure. Especially meritorious in advancing brain surgery in America as regards technic and diagnosis has been the work of Halsted's school, more particularly that of Cushing, who probably at this time possesses the greatest experience in this domain. We are only just beginning to gather experiences, and the technic also needs further perfection. Whether improvements in methods of diagnosis will lead to early recognition of the disease, and with this to early operation for brain tumor, is still an open question. Should success in this direction reward our efforts, we shall later be able to look back with the greater satisfaction on our surgical achievements.

ABSTRACT OF DISCUSSION

Dr. William G. Spiller, Philadelphia: Dr. Küttner has mentioned the difficulties of differentiating between brain tumor and simple hydrocephalus. Any one doing decompression should not imagine that he is doing a trivial operation. It does not usually produce serious results, but it may produce very grave results. Dr. Küttner's paper is decidedly pessimistic. Decompression should be done only when there are proper indications for its use. I have seen decompression make a mild dementia very grave; I have also seen it produce hemiplegia by pressure of the blood-vessels against the bone at the opening. The hernia itself is disfiguring, but the disfigurement should be disregarded if the results otherwise are satisfactory. Decompression will do no good in saving vision if optic atrophy has occurred, and I have declined to recommend it under such circumstances. It is not always possible to determine whether optic atrophy has occurred. In high grades of choked disk decompression seems almost useless for atrophy will almost invariably follow.

At the meeting of the New York Neurological Society and Section in Neurology of the New York Academy of Medicine last fall I called attention to a condition which has been almost entirely overlooked—the enlargement of the brain itself occurring with tumor. I have seen this enlargement of the brain with other tumors than glioma and believe it is caused by irritation from the tumor. This enlargement helps very materially in the production of intracranial pressure. Puncture of the corpus callosum is of great interest and importance.

The diagnosis between hydrocephalus and tumor is difficult, as Professor Küttner mentioned. I think we have a valuable means in the roentgenogram. In many cases of intense intracranial pressure the Roentgen rays will show on the inner table of the skull markings like the convolutions of the brain. This is not a positive means of diagnosis and yet I think it is valuable. It is more likely to occur with hydrocephalus, when pressure is great, than with tumor. It may occur with tumor if the tumor has developed slowly. Most tumors produce much pressure and are likely to cause death before this atrophy of bone is intense. Circumscribed hydrocephalus under certain circumstances cannot be helped by puncture of the corpus callosum.

Professor Küttner has referred to brain puncture. So far as I know it is a method which has not been received favorably by American and English surgeons. He also referred to cases of brain tumors without symptoms. Symptoms may be slight when a glioma does not destroy the axis cylinders passing through the tumor, though it may destroy the medullary sheaths.

STUDIES IN LIVER FUNCTION*

A. M. CHESNEY, M.D.
E. K. MARSHALL, JR., PH.D.
AND
L. G. ROWNTREE, M.D.
BALTIMORE

In recognition of the need of better criteria for judging of the functional capacity of the liver in disease, this investigation was undertaken to determine (1) the degree and frequency with which functional changes can be demonstrated in anatomically diseased livers, (2) in what clinical types of liver injury the functional changes are most marked and (3) the diagnostic and prognostic value of these changes. In other words, an attempt has been made to regard the liver, in disease, from a physiologic point of view, and to study its various functions with the hope of ascertaining its behavior under pathologic conditions.

THE FUNCTION OF THE LIVER IN HEALTH

In health the liver has three well-established functions: 1. The glycogenic function, which has to do with carbohydrate metabolism, and consists in (*a*) the conversion of the monosaccharids (dextrose, levulose and galactose) into glycogen; (*b*) the temporary storage of that glycogen as such, and (*c*) the reconversion of it by enzyme activity into dextrose as needed in the body. 2. A participation in nitrogenous metabolism which consists in the conversion of certain nitrogenous bodies (ammonia, amino-acids, etc.), into urea. 3. The production of bile.

In addition, the liver apparently plays a part in the production of fibrinogen and antithrombin, although the connection of the latter functions with the liver is not so well established as the first three mentioned.

THE TESTS OF LIVER FUNCTION

The following tests based on well-known physiologic functions of the liver have been employed:

1. *Carbohydrate Metabolism.*—In this connection two tests have been employed, namely, Strauss'[1] levulose test and Bauer's[2] galactose test. The former consists in the ingestion of 100 gm. of levulose on an empty stomach and the examination of the urine voided during the next few hours to determine the presence or absence of the sugar, using Fehling's and Seliwanoff's tests. Bauer's is similar to Strauss' test except that 30 gm. of galactose are used instead of 100 gm. of levulose. The ingestion of these sugars in the amounts indicated does not result in their appearance in the urine in normal individuals, according to Strauss. Their appearance in the urine is due to a decrease in tolerance for these substances, indicative of decreased functional capacity of the liver.

2. *Nitrogenous Metabolism.*—In relation to nitrogenous metabolism and liver function a study of the nitrogen partition in the blood and in the urine has been made. If the liver converts the ammonia and amino-acids of the blood into urea, then it might be expected that in liver injury we should find a decrease in the urea percentage of the total non-protein nitrogen of the blood and an increase in the amino-acid nitrogen of the blood, while in the urine we might expect to find a decrease in the relative amount of urea with an increase in the ammonia and amino-acids. (The view that the liver is not wholly responsible for the conversion of the ammonia and amino-acids of the blood into urea has recently received support from the work of Folin[3] and Van Slyke[4] and of Fiske and Sumner.[5])

3. *Urobilinogen.*—It has been maintained by many observers that the presence of urobilinogen in the urine is indicative of liver disease. Determinations were made in the majority of cases, but owing to the work of Wilbur and Addis[6] and our own unsatisfactory results, they were discontinued. These investigators showed that observations on a single or a twenty-four-hour specimen have no significance. Great variations occur from day to day. Only when repeated tests are made covering a period of two weeks, controlled by studies of the urobilin content of the feces, can findings be accepted.

4. *Fibrinogen.*—There is evidence to show that the liver is active in the formation of fibrinogen, and Whipple[7] has suggested that the determination of the amount present in oxalated plasma may be used as an index of liver function.

5. *Lipase.*—Whipple[8] has also suggested that the estimation of the lipolytic activity of the blood may constitute a test of liver function.

---

* From the Medical Clinic of the Johns Hopkins Hospital, and from the Departments of Physiological Chemistry and Pharmacology of the Johns Hopkins University.

* Read before the Section on Practice of Medicine at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Strauss: Berl. klin. Wchnschr., 1898, xxxv, 398; ibid., 1899, xxxvi, 159; Deutsch. med. Wchnschr., 1901, xxvii, 757.
2. Bauer: Wien. med. Wchnschr., 1906, lvi, 20.
3. Folin: Jour. Biol. Chem., 1912, xi, 87.
4. Van Slyke, D. D.: Jour. Biol. Chem., 1913, xvi, 213; Protein Assimilation, abstr., THE JOURNAL A. M. A., April 12, 1913, p. 1183.
5. Fiske and Sumner: Jour. Biol. Chem., 1914, xviii, 285.
6. Wilbur, R. L., and Addis, Thomas: Urobilin: Its Clinical Significance, Arch. Int. Med., February, 1913, p. 235.
7. Whipple and Hurwitz: Jour. Exper. Med., 1911, xiii, 136. Whipple, G. H.: Hemorrhagic Disease—Septicemia, Melena Neonatorum and Hepatic Cirrhosis, Arch. Int. Med., March, 1912, p. 365. Whipple, Mason and Peightal: Bull. Johns Hopkins Hosp., 1913, xxiv, 207.
8. Whipple, Mason and Peightal: Bull. Johns Hopkins Hosp., 1913, xxiv, 207. Whipple, Peightal and Clark: Ibid., 1913, xxiv, 343. Whipple: Am. Jour. Physiol., 1914, xxxiii, 50.

6. *Phenoltetrachlorphthalein.*—This drug was introduced by Rowntree, Hurwitz and Bloomfield[9] as a test for hepatic function, and clinical studies by them and simultaneous experimental studies by Whipple and co-workers[8] showed that a normal excretion could be established and that many liver injuries, particularly of severe grades, were associated with a decided decrease in the phenoltetrachlorphthalein output. Further studies with this test have been carried on.

7. *Fibrinolytic Ferment.*—Dr. Goodpasture of the pathologic staff was already interested in the presence of a fibrinolytic ferment in the blood in liver cirrhosis when this work was undertaken. Samples of blood from all our patients were submitted to him for study, and through his courtesy we present the results of his studies, details of which will appear later. The ferment is specific for fibrin, does not attack fibrinogen and is destroyed by heating to 56 C. (132.8 F.).

METHODS AND NORMAL LIMITS OF TESTS

Phenoltetrachlorphthalein.—This test was employed according to the method described by Rowntree, Hurwitz and Bloomfield, details of which are given in full in their publication.[9] The lower limit of normal excretion is considered to be 30 per cent. in forty-eight hours after the intravenous injection of 400 mg. of the substance. In health, phenoltetrachlorphthalein is practically never excreted in the urine after injection of such amounts.

Fibrinogen.—The heat coagulation method as described by Whipple[10] was used in these determinations, and values below 350 gm. per hundred c.c. were regarded as abnormal.

Lipase.—Determinations of the lipolytic activity of the blood were made, using Loevenhart's[11] method, which consists in the determination of the total acid production of the blood when exposed to known quantities of ethyl butyrate at 37 C. (98.6 F.). The result is expressed as the number of cubic centimeters of tenth-normal acid produced by 1 c.c. of plasma and 0.26 c.c. ethyl butyrate, diluted to 4 c.c. and allowed to react for from twenty to twenty-four hours. The upper limit of normal has been taken to be 0.40 c.c. of tenth-normal acid.

The Nitrogen Partition in the Blood and Urine.—The total non-protein nitrogen of the blood was estimated by the micro-Kjeldahl method of Folin and Denis,[12] with slight modifications, as suggested by Dr. B. B. Turner.[13] The urea percentage of the total non-protein nitrogen of the blood was determined by Marshall's[14] method, utilizing soy bean urease, and values below 40 per cent. have been regarded as abnormal.

The amino-acid determinations were made by Van Slyke's[15] method. As yet, data concerning the amount of amino-acids present in the blood of normal individuals are scarce, but from a study of patients who were practically normal, 3 mg. per hundred c.c. of serum has been the value regarded as the upper limit of normal for the free amino-acid nitrogen.

The total nitrogen of the urine was determined on twenty-four-hour specimens collected under toluol by the Kjeldahl-Gunning method, the urea by Marshall's[16] and the ammonia by Folin's[17] method. The distribution of the urinary nitrogen between urea and ammonia has been shown to be dependent on the total excretion of nitrogen. The normal limits of the various nitrogenous constituents of the urine, with varying levels of nitrogen excretion, are therefore hard to define sharply. However, one can probably safely conclude that with a urinary nitrogen excretion of 10 gm. or more, the lower limit for urea nitrogen is 80 per cent. and the upper limit for ammonia nitrogen is 5 per cent., while with a nitrogen excretion of from 5 to 10 gm., the lower limit for urea is 70 per cent. and the upper limit for ammonia is 8 per cent. Furthermore, excessive acid production in the organism is accompanied with a lowering of the urea percentage and an increase in the ammonia percentage. The free amino-acid in the urine was determined by Van Slyke's[18] method, and 1.5 per cent. has been adopted as the upper limit of normal. Future work may change these values.

SUMMARY OF FINDINGS

Forty-five cases have been studied in this series, in nearly all of which some abnormality of the liver was thought to be present. Some of the cases called cirrhosis were certainly not far advanced, and in some instances it appeared that the diagnosis was not definite, differences in opinion being frequently encountered. On account of lack of space the details of the cases are not given here,[19] but a summary of the results obtained is given in Table 1.

Column 1 shows total number of tests made, Column 2 the total number of positive results, while the remaining columns show the number of positive results in the various diseases. The figures in italics indicate the number of cases in which each particular test was applied in the particular disease studied, while the other figures indicate the number of positive findings in the particular disease.

From this table it will be seen that the following results were obtained: The *phenoltetrachlorphthalein test* was applied in the feces in 42 cases with 16, and in the urine in 34 cases with 21 positive. *Fibrinogen* was determined in 40 instances, 8 of which were below 350 mg. and 12 below 400 mg., while 8 were above 800 mg., that is, 20 abnormal findings. The *lipolytic activity* of the blood was investigated in 39 cases, 5 of which showed an acid production of more than 0.4 c.c. and 3 above 0.5 c.c. The presence of *fibrinolytic ferment* was tested for in 40 instances, and found in 7, all of which were cirrhoses. The *galactose* test was applied in 29 and the *levulose* in 19 cases, the former showing only 4 and the latter 2 positive findings. The *total non-protein nitrogen* and *urea nitrogen of the blood* were determined in 37 cases. The urea nitrogen was less than 40 per cent. of the total in 9 instances. The *amino nitrogen of the blood* was determined in 35 cases, and amounted to more than 3 mg. per hundred c.c. in 25 instances and above 4 mg. in 13 instances. The *total nitrogen urea and ammonia in the urine* were determined in 41 cases. The total nitrogen of the urine was above 10 gm. in 13 cases, and in these

9. Rowntree, Hurwitz and Bloomfield: Bull. Johns Hopkins Hosp., 1913, xxiv, 327.
10. Whipple: Am. Jour. Physiol., 1914, xxxiii, 50.
11. Loevenhart: Am. Jour. Physiol., 1902, vi, 331.
12. Folin and Denis: Jour. Biol. Chem., 1912, xi, 527.
13. These modifications will be described shortly by Dr. Turner.
14. Marshall: Jour. Biol. Chem., 1913, xv, 487.
15. Van Slyke: Jour. Biol. Chem., 1912, xii, 399.
16. Marshall: Jour. Biol. Chem., 1913, xiv, 283; xv, 495.
17. Folin: Ztschr. f. physiol. Chem., 1902, xxxvii, 161.
18. Van Slyke: Jour. Biol. Chem., 1913, xvi, 121.
19. Findings of all tests, clinical notes, necropsy findings in fatal cases together with a discussion of the functional findings appear in the article in the Proceedings of the Society of American Physicians, 1914.

the urea nitrogen was below 80 per cent. in 7 instances, and the ammonia nitrogen above 5 per cent. in 10 instances. Twenty-one cases showed a urinary nitrogen between 5 and 10 gm., and of these, 4 cases showed a urea nitrogen below 70 per cent. and 11 an ammonia nitrogen above 8 per cent. The *amino-acid nitrogen* content of the urine was investigated in 22 cases, 12 of which showed values above 1.5 per cent. of the total nitrogen.

Liver Cirrhosis.—The results in the fourteen cases of cirrhosis studied were as follows: Phenoltetrachlorphthalein studied in feces in 14, positive in 6, in urine in 11, positive in 7; fibrinogen in 14, positive in 6; lipase in 14, positive in 2; fibrinolytic ferment in 14, positive in 7; galactose in 11, positive in 2; levulose in 10, positive in 2; urea nitrogen percentage (blood) in 14, positive in 5; amino nitrogen (blood) in 14, positive in 10; urea percentage (urine) in 14, positive in 3; ammonia percentage (urine) in 14, positive in 10; amino nitrogen percentage (urine) in 7, positive in 5.

Myocardial Insufficiency.—Twelve cases of myocardial insufficiency were studied. Phenoltetrachlorphthalein studied in feces in 9 cases with 1 positive, lowest being 18 per cent., and in urine 10 cases with 5 positives; fibrinogen in 11 with 1 positive; lipase in 11 cases with 1 positive; fibrinolytic ferment in 12, positive in none; galactose in 7, positive in none; levulose in 3, positive in none; urea nitrogen percentage (blood) in 12, positive in 1, in which 6 were over 50 per cent., and 3 over 60 per cent.; amino nitrogen (blood) in 9, positive in 7.

The functional injury in liver cirrhosis is relatively greater than in chronic passive congestion, for a consideration of all the tests in each condition indicates that in 10 of the 14 cases of cirrhosis there was definite functional injury, 3 with less marked injury and only one with a practically normal function throughout, while in chronic passive congestion only 4 showed definite decrease, while 7 showed a practically normal function.

Carcinoma of Liver.—Little data outside of the phenoltetrachlorphthalein have been collected. C 28, who definitely had metastasis to the liver,[20] showed a 23 per cent. output five months before death. H 29, with gastric carcinoma and clinically thought to have metastasis to the liver, showed a 24 per cent. output, phenoltetrachlorphthalein positive in urine and the urea only 21 per cent. of the total non-protein nitrogen of blood. These cases are in keeping with the three cases of liver carcinoma reported last year in which the phenoltetrachlorphthalein excretion was 8, 14 and 7 per cent., respectively. However, a slight decrease in phenoltetrachlorphthalein, for instance, from 20 to 25 per cent. does not indicate liver carcinoma, since such findings have been found in gastric carcinoma when no proof of liver metastasis was at hand, in which case it is merely the expression of the influence of anemia and cachexia on liver function.

Anemia.—Clinically, a severe grade of anemia depresses the function of the liver as indicated by phenoltetrachlorphthalein. That there is also a decrease in the fibrinogen has been shown by Whipple, but owing to the quantity of blood necessary for carrying out the test, it is not applicable in all cases of anemia. Changes in the urinary nitrogen partition may appear.

Luetic Hepatitis.—Of the two cases studied, one showed normal phenoltetrachlorphthalein, a low lipase, urinary nitrogen partition changes and a positive galactose, while the other showed a low phenoltetrachlorphthalein content in feces, positive in urine, an abnormally high fibrinogen, low urea percentage of total non-protein nitrogen in blood and urinary nitrogen partition changes.

Polyserositis.—Two cases with much the same clinical condition and both with large livers showed practically identical findings, for instance, normal phenoltetrachlorphthalein in feces, but positive in urine, fibrinogen and lipase normal, low urea percentage of total non-protein nitrogen in blood, and changes in urinary nitrogen partition, but no decreased tolerance for sugar.

TABLE 1.—SUMMARY OF FINDINGS

	Total Number of Tests	Total Number of Positive Tests	Cirrhosis of Liver		Myocardial Insufficiency		Carcinoma		Syphilitic Hepatitis		Pernicious Anemia		Polyserositis		Miscellaneous	
Number of cases tested	..	..	..	14	..	12	..	3	..	2	..	2	..	2	9	10
Phthalein in feces	42	16	14	6	9	1	3	2	2	1	2	2	2	0	9	4
Phthalein in urine	34	21	11	7	10	5	3	2	2	1	1	0	2	2	5	4
Fibrinogen	36	8	14	6	11	1	1	0	2	0	—	—	2	0	1	1
Fibrinolytic ferment	40	7	14	7	12	0	1	0	2	0	—	—	2	0	9	0
Lipase	39	5	14	2	11	1	1	0	2	0	—	—	2	0	9	2
Galactose	29	4	11	2	7	0	1	0	2	1	1	0	2	0	4	2
Levulose	18	2	10	2	8	0	0	0	—	—	1	0	1	0	3	0
Blood:																
Urea-N %	37	9	14	5	12	1	1	0	2	1	—	—	2	2	6	0
NH_3-N	35	25	14	10	9	7	1	1	2	1	—	—	2	1	6	4
Urine:																
Urea-N %	41	11	14	3	11	3	2	0	2	2	2	1	2	0	8	2
NH_3-N %	41	28	14	10	11	7	2	0	2	2	2	2	2	2	8	5
NH_3-N %	22	12	7	5	6	2	1	0	1	2	1	0	1	1	5	2

THE PHENOLTETRACHLORPHTHALEIN TEST

Previously the results of eighty applications of the test on sixty-seven patients were reported. The total number of patients studied to date is 113, thirty-three of whom had no clinical evidence of liver disease. The positive findings in health and in various types of liver disease, together with the appearance of the drug in the urine, are shown in Table 2.

NECROPSY CASES

In this series five cases came to necropsy, and pathologic findings controverting the functional findings have not been encountered. It is of interest to note

20. Details of these cases can be found in the article in the Proceedings of American Physicians.

that two of the cases which clinically were thought to be cirrhosis of the liver, but showed slight functional changes, proved, at necropsy, to have no cirrhosis at all, but to be cases of chronic peritonitis in which the liver was enlarged owing to a thickened capsule. In one instance, a case of cirrhosis, microscopic study of the liver suggested greater injury than was shown by the functional studies. In the six cases which came to necropsy last year there was harmony between the anatomic and functional findings of the phenoltetrachlorphthalein test.

RELATIVE VALUES OF TESTS

The series of cases is not sufficiently large to draw far-reaching conclusions as to the relative values of the different tests, but the following impressions have been received:

(*a*) Phenoltetrachlorphthalein: A phenoltetrachlorphthalein output in the feces below 30 per cent. or its appearance in the urine is infrequent in health and frequent in anatomically diseased livers. A normal output does not exclude liver injury.

(*b*) Fibrinogen: Low values are frequent in cirrhosis, but inconstant. Very low findings may carry prognostic significance.

TABLE 2.—POSITIVE FINDINGS IN HEALTH AND IN LIVER DISEASE

	Examined	Less Than 30 Per Cent.	Urine Examined	Positive
Normals	33	2	22	3
Cirrhosis	18	9	11	7
Congestion...	32	11	10	6
Carcinoma of liver	6	6	3	2
Carcinoma ..	5	3	3	2
Luetic liver..	5	2	2	1
Severe anemia	9	7	1	0
Miscellaneous.	5	2	2	2
Totals	113	42	54	23

(*c*) Lipase: Determination of lipolytic activity of blood furnishes little or no information of diagnostic or prognostic value in these types of cases.

(*d*) Bauer's galactose and Strauss' levulose tests yielded very little information in this series.

(*e*) Dr. Goodpasture's fibrinolytic ferment studies on this series of cases show that this ferment is present only in cirrhosis and hence when present is of diagnostic value.

(*f*) Blood Nitrogen Partition: Urea nitrogen was low in several instances and especially low in cases of advanced cirrhosis. Amino-acid nitrogen was high in a considerable proportion of the cases.

(*g*) Urinary Nitrogen Partition: The ammonia and aminonitrogen were increased in most of the cases studied, particularly in cirrhosis. Owing to the non-exclusion of acidosis considerable difficulty is experienced in interpreting these results. It would have been advisable to have attempted to exclude acidosis by the feeding of alkalies.

PRACTICABILITY OF TESTS

The phenoltetrachlorphthalein test involves an intravenous injection and careful collection of stools for forty-eight hours. Three undesirable features are connected with its application: 1. The quality of red color obtained in certain instances (from 10 to 20 per cent. of the cases) is such that accurate quantitative estimation is difficult. Only in rare instances is this a serious difficulty leading to error of more than 5 per cent. 2. Thrombosis frequently follows at the point of injection, as evidenced by slight local pain or tenderness together with resistance offered to the palpating finger along the course of the vein. This occurred in eight instances in this series of cases, but in no case has it occasioned serious discomfort or resulted in actual harm to the patient. 3. With salt solution made with freshly distilled water chills following the injection are infrequent. When no dilution is employed chills are less frequent and not accompanied with increase in temperature.

Fibrinogen determinations are inapplicable in the presence of severe anemia. They necessitate the withdrawal of from 40 to 50 c.c. of blood. A high speed centrifuge and considerable chemical equipment are requisites. The test is time-consuming. *Lipase determinations* require neither complicated apparatus nor much time. *The determination of the total non-protein nitrogen, urea nitrogen and amino-acid nitrogen* of the blood cannot be carried out when severe anemia exists. Technically the determinations are easy but are time-consuming. *The nitrogen partition* in the urine requires somewhat less time. *Galactose* can be administered without discomfort to the patient, but technical difficulties attend the use of *levulose*, at least 25 per cent. of the patients refusing to take the full amount or developing nausea or vomiting following its ingestion. *The fibrinolytic ferment* is readily demonstrated. *Urobilinogen determinations* in the urine are valueless unless made daily for a period of two weeks and unless associated with urobilin determinations in the feces.

CONCLUSIONS

1. Outspoken changes in liver function can be demonstrated in most cases of advanced liver cirrhosis, in markedly congested livers associated with myocardial insufficiency, in carcinoma of the liver, in luetic livers and in conditions of cachexia with marked anemia.

2. Functional changes have been most marked in cirrhosis, neoplasm of the liver and in cachectic conditions associated with severe grades of anemia. Functional changes in chronic passive congestion have not been frequent or pronounced.

3. Harmony in the findings of the tests is present in some cases, that is, most of the tests indicating either a decrease function or a normal function. However, lack of harmony is striking in other cases.

4. Concerning the relative merits of these tests the impressions that have been received are that the determination of the phenoltetrachlorphthalein excretion, the fibrinogen, and the nitrogen partition in the blood and urine are of decided value in revealing the presence of, and to a less degree the extent of, functional involvement, while the demonstration of a fibrinolytic ferment is of decided diagnostic importance. The determination of the sugar tolerance and of the lipolytic activity of the blood apparently afford information of much less value.

The information derived from these studies on the liver does not compare in diagnostic and prognostic value with that derived from corresponding studies of the kidney. This may depend on several factors, namely, (*a*) the inadequacy of our knowledge of liver physiology; (*b*) the limited number of cases and of types of severe liver injury under observation; (*c*) the possible existence of a great "factor of safety" in

the liver, whereby in case of necessity function is carried on efficiently by a relatively small proportion of liver substance; (*d*) the fact that the prognosis in many of these cases is controlled by factors other than decreased liver function, and (*e*) the lack at present of correlation of anatomic, clinical and functional findings occasioned by the newness of the subject. The results, however, encourage us in the belief that scientifically and also clinically this subject is worthy of extensive investigation.

ABSTRACT OF DISCUSSION

DR. WILLIAM S. THAYER, Baltimore: In the Johns Hopkins Hospital we believe that these tests have brought us somewhat nearer to an understanding of liver disease, but there is still much to be done. The tetrachlorphenolphthalein test for hepatic function is by no means of so clear a value as the phenolsulphonephthalein test for renal function, but the work may well lead to something in the future.

NINETY-THREE PERSONS INFECTED BY A TYPHOID CARRIER AT A PUBLIC DINNER

WILBUR A. SAWYER, M.D.

Director of the Hygienic Laboratory of the California State Board of Health

BERKELEY, CAL.

The city of Hanford, Cal., experienced an explosive outbreak of typhoid fever in the latter part of March, 1914. The epidemic consisted of ninety-three cases, all of which were traced to a church dinner. The infection came from a typhoid carrier among those who prepared and served the food—a woman who did not suspect that she had ever had typhoid fever.

Of special interest were the incubation periods, which were, in the majority of instances, less than eight days. The shortest was three days.

The disconcerting observation was made during the investigation that under conditions which are not at all unusual, baking can actually incubate the inner portions of masses of food instead of sterilizing them.

THE OUTBREAK

The epidemic began with one case on March 20. During the following three days the daily number of

TABLE 1.—CASES IN THE HANFORD EPIDEMIC

Proved cases of typhoid fever	45
(Cases giving a complete Widal reaction [dilution, 1:50] or a positive blood-culture.)	
Cases of Typhoid Fever giving a partial Widal reaction	23
(Cases showing the symptoms of typhoid fever and giving a partial Widal reaction; most of these tests were made early in the disease.)	
Cases of typhoid fever not giving the Widal reaction	7
(Cases presenting typical symptoms but failing to give the Widal reaction early in the disease; blood for further tests not obtained.)	
Cases of typhoid fever not submitted to the Widal test	9
(Cases showing typical symptoms; blood not obtained for the Widal test.)	
Doubtful cases of typhoid fever	9
(Cases showing symptoms suggestive of mild typhoid fever, but negative to the Widal test; blood not obtained late in the disease.)	
Total number of cases	93

new cases rose rapidly to the maximum, nineteen. After that the number fell quickly. The last case developed on April 16.

On request of Dr. J. A. Crawshaw, the president of the Hanford Board of Health, to the California State Board of Health, Dr. W. W. Cross was sent to investigate the early cases. His report stated that they were typhoid fever.

April 1, the State Board of Health instructed me to go to Hanford to investigate the outbreak and to advise measures for its control. I arrived in the morning of April 2 and stayed until the local investigation was finished, April 18. Most of the patients were visited at least once, and as a rule blood was taken for the Widal test or for a culture. The Hanford Board of Health, Dr. C. L. Scott, city and county health officer, and the physicians of Hanford cooperated vigorously in the investigation and furnished valuable assistance.

The total number of cases in the outbreak was ninety-three. Several other cases were investigated and were found not to be typhoid fever. The ninety-three cases were classified as in Table 1.

In Table 2 the cases are classified according to severity.

TABLE 2.—CASES CLASSIFIED ACCORDING TO SEVERITY

	Including Doubtful Cases	Excluding Doubtful Cases
Moderate and severe cases	77	77
Mild cases (in bed for very few days)	11	5
Ambulatory cases	5	2
Totals	93	84

Three of the severe cases resulted in death and several others in serious danger. The low mortality (3.2 per cent.) is in part due to the discovery in this sudden epidemic of more of the mild and ambulatory cases than would ordinarily have been detected.

The ages of the patients ranged from 16 months to 65 years. A baby 16 months old developed a severe case of typhoid fever and her blood gave a positive Widal reaction.

The majority of the cases of typhoid fever were typical.

Blood-cultures were taken in eleven of the cases, and the typhoid bacillus was isolated and identified in four.

Previous attacks of typhoid fever, without laboratory confirmation, were reported by fourteen of the patients.

A number who ate at the dinner were sick during the following night from a mild form of food poisoning which probably had no relation to the typhoid epidemic.

A number of the persons infected at Hanford traveled considerable distances during the incubation period. This illustrates how typhoid fever is carried into cities which are not responsible for the infection. Two of the ninety-three persons traveled over 200 miles to San Francisco, and developed the disease there. Three of the cases developed in Fresno, 30 miles north of Hanford. Although typhoid fever was conveyed to San Francisco, Fresno, Exeter, Alpaugh, Tulare, Armona and Selma, and to ranches in the country around Hanford, no secondary infections from these cases have come to my attention.

The infection could not be traced to the water, milk or vegetable supplies.

THE INFECTION TRACED TO A PUBLIC DINNER

Early in the investigation it was definitely determined that the infection came from food served at a public dinner and supper held in a public hall, March 17. All of the ninety-three persons who developed typhoid fever ate food served there. Eighty-five of the patients attended one or both of the meals and

received their infection in this way. The other eight were infected from eating food brought to their homes from the hall by friends.

A few examples taken from the great mass of evidence collected will illustrate the definiteness with which the outbreak was traced to the dinner on March 17.

After the noon meal several kinds of food were sent to a family which had recently undergone considerable hardship owing to the prolonged illness of the mother. She had undergone a severe surgical operation, and after spending a month in a hospital, which was free from typhoid fever, she had reached home on the day before the dinner. The family ate of the food and the mother and the four children developed typhoid fever.

In another household the mother helped at the dinner and ate there. Afterward she brought home some of the food to her children. The mother and two sons came down with typhoid fever. In another family the son was unable to attend the dinner, owing to his work in a nearby town. The mother helped at the dinner and ate there, and afterward took food home for her son. Both of them developed typhoid fever.

THE INCUBATION PERIOD

The Hanford outbreak furnished an unusual opportunity for observing the duration of the incubation period in typhoid fever, as the exact time of infection was known. It is customary in investigating typhoid epidemics to determine the dates of onset and to count back about fourteen days to find the probable date of infection. This method would have excluded from consideration the real cause of this epidemic, as it would have indicated that the probable date of infection was at least a week before the date of the dinner which caused the epidemic. The first case developed three days after the dinner, and the sixth day after the date of infection saw the appearance of the greatest number of cases. Over half (forty-nine) of the ninety-three cases had developed by the evening of the seventh day, and over two-thirds (sixty-four) before the tenth day. The last case developed on the twenty-ninth day. The incubation periods and dates of onset are shown in the accompanying chart.

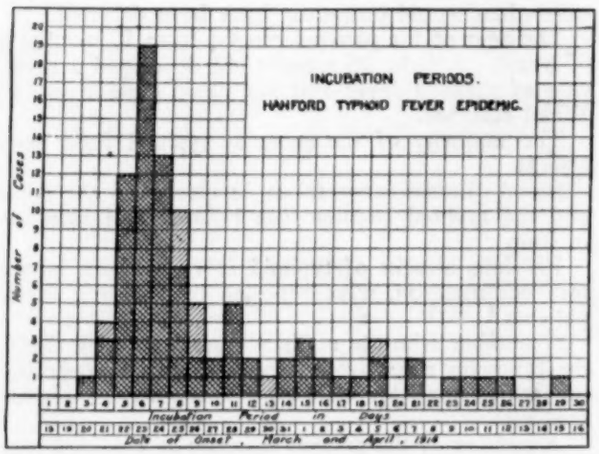
INCUBATION PERIODS.
HANFORD TYPHOID FEVER EPIDEMIC.
Number of Cases
Incubation Period in Days
Date of Onset. March and April. 1914

Chart of the cases in the Hanford typhoid fever epidemic, showing incubation periods and dates of onset. The heavily shaded areas represent definite cases of typhoid fever. The lightly shaded areas represent the doubtful cases.

THE SOURCE FROM WHICH THE FOOD WAS INFECTED

While the infection was easily traced to the public dinner, the source from which the food became infected was at first obscure. Fifty-five of the patients were interviewed and information was obtained from others through their physicians. The facts regarding the kinds of food eaten at the dinner were tabulated and studied. Those who planned and prepared the dinner were very helpful in furnishing information.

The dinner was a church dinner partaken of by about 150 persons, about 125 eating at noon and 45 in the evening. Of the 150 who ate at the hall 85 (57 per cent.) developed typhoid fever.

The bill of fare at the noon meal consisted of chicken pie, mashed potatoes, Spanish spaghetti, baked beans, potato salad containing onions and hard-boiled eggs and served on lettuce, bread and butter, olives, several kinds of pie, cheese, iced tea, and coffee. At the evening meal ice-cream and cake were added to the list. Most of the food was donated, and was prepared at various homes or at the hall. Butter, bread and potatoes were bought from stores whose other customers remained well.

Most but not quite all those present ate chicken pie. Investigation showed that these chicken pies had come from several different households, and it was found that at least three of these various lots had been served to persons who became infected. The gravy served on the pie sometimes came from the pie itself and sometimes from a pan of extra gravy. This could not explain all of the infections.

A considerable number of those infected did not eat the mashed potatoes. The milk used in the preparation of the mashed potatoes and in the coffee came from cows on the farm of one of the women who contracted typhoid fever at the dinner. The farm had previously been free from the disease. No milk was drunk at the dinner.

Next to the chicken pie, the Spanish spaghetti was the dish eaten by the largest number of the persons who became sick. Since the chicken pie was of three or more lots, the spaghetti was the dish eaten in common by the most of the typhoid patients. A few, however, were positive that they had not eaten the spaghetti.

Only a few ate the baked beans. Many did not eat the potato salad. The lettuce leaves on which the salad was served were donated from a private garden which had been watered with city water and fertilized with horse-manure from the barn on the premises. The family had been eating this lettuce and had remained entirely well until two members were infected with typhoid fever at this dinner. Each of the other items, bread, butter, olives, each of several kinds of pie, cheese, iced tea and coffee, could be excluded from being the principal vehicle of infection because it had not been eaten by a considerable number of the typhoid patients. The ice-cream served in the evening was not under suspicion as most of the persons were infected at the noon meal.

From this inquiry the infection could not be traced to any one item of food, as no one kind was common to all cases. It appeared that the typhoid bacilli must have been distributed on the dishes and in various kin 's of food.

While there was no common article of food, there was abundant opportunity for the transfer of infection from one kind of food to another. In serving, the

usual procedure was to place the chicken pie, spaghetti and mashed potatoes together on each plate before it was brought from the kitchen. Moreover, the hurried washing of dishes by hand would distribute typhoid bacilli from a heavily infected food over all the dishes and utensils. At first the dishes were washed in cold water and later in hot.

It appeared that the food had most probably been infected by an ambulatory case, or carrier, who had taken an active part in preparing and serving the food at the hall. The number of persons infected suggested that the total quantity of typhoid bacilli in the food was unusually large. While infectious material might have reached the food from the contact of an ambulatory case or carrier during the final preparation and serving, this did not satisfactorily account for the massive infection. It seemed more probable that some item of food which was favorable to the multiplication of the typhoid bacilli had been contaminated long enough before the dinner to permit considerable multiplication. As the evidence did not point definitely to any single item of food as the conveyer of the infection, it became necessary to search for the original source by investigating all the persons who had been active in preparing or serving the dinner.

In searching for the source of the infection it was of considerable assistance to know that typhoid bacilli were present in the food as early as twenty minutes after 11 in the morning. At that time the first patrons of the dinner were infected.

Twenty persons had sufficient connection with the dinner to need special investigation. Sixteen of these were women who were actively engaged in preparing or serving the food. One of the twenty persons did not eat at the hall. The other nineteen ate the food, and twelve of them developed typhoid fever. One of these cases began late in the investigation.

The eleven who had developed typhoid fever were investigated on the supposition that they might have been ambulatory cases at the time of the dinner, and those who remained well were studied as possible typhoid carriers. Two of the group of persons who developed typhoid fever received special attention. The first was a woman who developed typhoid fever on the third day after the dinner. She gave a partial Widal reaction as late as the fifteenth day of her illness, and a distinct positive on the twenty-first. As far as could be learned she had had no opportunity for becoming infected except at the dinner. She supplied no food for the dinner, and her work at the hall consisted principally in washing dishes. The second of these patients gave a suggestive history, since he had suffered several attacks of cystitis and malaise, but these were shown not to be due to typhoid bacilli.

There was nothing in the history of the others who developed typhoid fever to indicate that they were ambulatory cases at the time of the dinner. All of this group of cases could be excluded as possible chronic carriers, as typhoid carriers could not have caused acute typhoid fever in themselves by eating bacilli to which they were constantly exposed and for which they possessed a high degree of immunity.

As the investigation progressed the conviction grew stronger that the infection came from one of nine persons who prepared and served food and had not developed typhoid fever at the time of this part of the investigation. The blood of each was examined and found negative to the Widal test. Two were excluded as possible sources of infection. One of them furnished no food to the dinner and did not help until noon, which was after the first persons eating at the hall had received their infection. The other furnished a pie and a cake and spent a half hour at the hall peeling potatoes. These foods were not under suspicion.

The remaining seven women had taken a very active part. All of them prepared food and most of them brought it from home. All of them took part in serving the dinner. Specimens of urine and feces were obtained in sterile bottles from each and were sent packed in ice to the State Hygienic Laboratory in Berkeley to be examined for typhoid bacilli.

There was danger that the laboratory examinations might not detect the carrier, as typhoid carriers are usually intermittent in the discharge of bacilli. Therefore as much circumstantial evidence as possible was collected at Hanford while the laboratory work was going on in Berkeley. Only two of the seven persons who were under special investigation gave a history of having had typhoid previously, and there were no cases among members of the households of these two until after the dinner, when children of both women came down, showing that people living in intimate contact with them were susceptible to the infection at the dinner. The husband of another one of this group of women had had typhoid fever twenty-two years before, and her daughter fourteen years before, but she herself had been running a boarding-house in which typhoid fever had not appeared. Another had had one case of typhoid in her family many years ago, before coming to California. Two more had not had typhoid fever in their families before the dinner. The daughter of one of these was infected at the dinner, and the mother herself came down with typhoid fever when the investigation was nearly completed.

One member of this group presented a history which made it seem probable that she was a chronic typhoid carrier. Mrs. X had formerly kept a boarding-house in Hanford. Seven and a half years before, in October, 1906, one of her twelve or fifteen boarders came down with typhoid fever. He was sick in the hospital for five or six weeks. The source of his infection was obscure, but his sickness was laid to a well from which he had drunk from three to five days before. A week after this case had appeared another man who was boarding with Mrs. X developed typhoid fever. His illness began Oct. 21, 1906, and kept him in bed for six weeks. Again the source of infection was not clear. He had not eaten away from the boarding-house for a month. The attack was laid to a hotel which he had visited while traveling, two months before. This man is at present in business in Hanford and I was therefore able to get the facts from him.

In March, 1912, two more cases appeared in the boarding-house of Mrs. X. She had moved since the first cases appeared. While she formerly bought milk from a dairy, she then kept a cow. A girl aged 15, who boarded with Mrs. X, came down first and was sick for five weeks with typhoid fever. No possible source of infection was discovered. The girl's mother is living in Hanford and was interviewed. There were about sixteen or eighteen boarders at that time. Four or five days after this case developed, on about March 14, 1912, another boarder, a young man, came down with typhoid fever. He had felt somewhat sick three or four days earlier. He is at present working in Hanford, and when seen, he stated that he had not eaten away from the boarding-house for three months

before his attack. The source of the infection remained undiscovered. He was sick in the hospital for five weeks. His blood was examined at the time and was stated to have given a positive Widal reaction.

The history of four previous cases of typhoid fever among the contacts of Mrs. X made it seem probable that she was a chronic carrier, and was the source of infection, not only of the four boarders, but also of the ninety-three persons infected at the dinner on March 17. Later the proof that she was a chronic carrier was received by telegram from the laboratory. The typhoid bacillus had been isolated from her feces, obtained April 9, and had been definitely identified by cultural and serologic tests. Her urine and the feces and urine from the other persons under special investigation were found to be free from typhoid bacilli. The source of the typhoid infection had been found in a chronic carrier, but a plausible method by which such a mass of infection could enter the food still remained to be discovered.

This carrier, Mrs. X, aged 63, had no knowledge of ever having had typhoid fever. The disease was present in her household thirty-five years before, when a daughter passed through an attack, and Mrs. X may have received her infection then. Unrecognized cases probably play a more important part in the spread of typhoid fever than is generally supposed, and are responsible for a considerable portion of typhoid carriers. In the Hanford epidemic sixteen (17 per cent.) of the ninety-three cases were mild or ambulatory cases and might easily have been overlooked had there been no epidemic. It is not improbable that some persons actually infected in this epidemic developed so few symptoms that they did not regard themselves as sick, and consequently were not discovered in the investigation.

Mrs. X, although not entirely well during recent years, has had no symptoms having any apparent bearing on this investigation. There is no history of gall-stone attacks. The son and daughter of Mrs. X went to the dinner and ate the food, but both escaped infection. This suggests that they may have been immune, owing to previous mild infection with typhoid bacilli from their mother.

Macroscopic agglutination tests were performed with antityphoid serum on the fifth and eighteenth generations of subcultures of the typhoid bacillus from the feces of Mrs. X and also on the well-known Hopkins strain as control. All three of these cultures gave complete agglutination and sedimentation for the dilution of 1:1,000 and some visible agglutination at 1:20,000. The three cultures were nearly equal in agglutinability. The cultures from Mrs. X showed little change in agglutinability between the third, fifth, and eighteenth generations, differing greatly in this respect from the strain previously isolated from a carrier at the State Hygienic Laboratory and found to be only slightly agglutinable in the third generation, but, in the eleventh, equal to the Hopkins strain in agglutinability.[1]

The strain of typhoid bacilli isolated from the feces of Mrs. X was tested in the third generation with serum in dilution of 1:50 from two of the typical typhoid cases in the Hanford epidemic. Under the microscope complete agglutination was observed to take place within half an hour.

Serum from Mrs. X was obtained on April 16 and was tested by the macroscopic agglutination test with the Hopkins strain and with her own strain. As controls, serums from two persons who had not had typhoid fever or typhoid vaccination were used. There was no agglutination of the Hopkins culture by any of the serums when the dilution was 1:100. The culture from Mrs. X was partially agglutinated at dilutions of 1:200 by one of the control serums and distinctly agglutinated by the serum of Mrs. X. When the higher dilutions of serum were used there was no agglutination. The test as made is so delicate that the results may be regarded as practically negative, although the serum of Mrs. X had a little more effect on her own culture than did the serum of the controls. The almost complete absence of agglutinins for the typhoid bacillus in the serum from Mrs. X suggests that her infection and immunization had not taken place recently, as there had been time for the Widal reaction to disappear. In this respect the conclusions in the laboratory confirmed the opinions based on the history of typhoid fever among her contacts.

THE MANNER IN WHICH THE INFECTION REACHED THE FOOD

The source of the infection had now been found to be Mrs. X, but the method by which the infection entered the food remained to be investigated. She helped serve the dinner, cutting the bread, waiting on table, and helping a little in the kitchen. She undoubtedly came in contact at the hall with the food or dishes of a considerable number of persons, and, while this could possibly explain the outbreak, it seemed improbable that the small number of bacilli which could easily be distributed in this way would infect so many people. This was especially true as Mrs. X did not reach the hall until about 10 o'clock in the morning and there was little time for incubation of typhoid bacilli in any of the foodstuffs before the first persons were infected, at twenty minutes after 11. The one article of food with which Mrs. X came in contact before the dinner was the Spanish spaghetti. She had prepared this dish at her home, up to the point of the final baking, which took place at the hall just before the dinner. This final baking would appear at first glance to justify the elimination of the spaghetti as the dish responsible for conveying the infection.

The Spanish spaghetti was prepared as follows: On the day before the dinner the spaghetti was boiled in water. Then it was washed and separated with city water running from a tap. On the same day a Spanish sauce was made out of a quart of milk, two cans of tomatoes, butter, seasoning, cooking soda, and the strained liquid in which dried peppers had been boiled. Probably a little flour was added for thickening. These ingredients were put together and cooked. On the day of the dinner, at about 10 a. m., the spaghetti and the sauce were mixed in a large dishpan and covered with cheese. The weather was warm and would have been conducive to the multiplication of bacteria. The spaghetti arrived at the hall between 10 and 10:30 a. m. and was put into the oven of a gas stove immediately. The late arrival of the spaghetti caused the women to fear that there would not be sufficient time for the proper baking of this important item on the bill of fare. When the first patrons arrived they were served from the upper and

1. Sawyer, Wilbur A.: A Typhoid Carrier on Shipboard, THE JOURNAL A. M. A., May 4, 1912, p. 1336.

warmer layers of the spaghetti, as it was thought that the deeper portions would not be as hot as desired.

The evidence would be strong that the spaghetti carried the infection if it could be shown that this dish was a good culture-medium and was not sterilized by the baking. Experiments were undertaken at the State Hygienic Laboratory to clear up these two points. A dish of Spanish spaghetti was prepared as nearly as possible according to the methods used by Mrs. X. The spaghetti and sauce were prepared separately. Some of the sauce was put in flasks and sterilized and set aside to be tested for its properties as a culture-medium. The remainder of the sauce and the spaghetti were inoculated with a broth culture of the typhoid bacillus of the strain from Mrs. X. The following day the sauce and spaghetti were thoroughly mixed in a small dish-pan and covered with one pound of grated cheese. The dish was not as large as the one prepared by Mrs. X and would therefore be more easily heated through. This mass of Spanish spaghetti was 5 inches deep and ranged from 9 to 13 inches in diameter. The oven of an ordinary gas range was heated to baking temperature and the dish of spaghetti was put in. After seven minutes the door was opened for an instant and it was noted that the cheese had melted. After fifteen minutes the dish was removed from the oven. The surface was not properly browned and the temperature in the middle of the spaghetti had risen only one degree above room temperature (from 16 to 17 C. or 60.8 to 62.6 F.). In the following half hour, while the dish was standing in the room, the temperature at the middle rose to 21 C. (69.8 F.) as the heat gradually penetrated to the inner portions. Cultures taken from various depths all developed colonies of typhoid bacilli.

A large hot-air sterilizer was then heated and kept between 160 and 170 C. (320 and 338 F.). The pan of spaghetti was introduced and subjected to this heat for thirty minutes. When the dish was removed the surface was of a golden brown color. The appearance and aroma suggested that the spaghetti was thoroughly cooked and very hot. The temperature near the top was 54 C. (129.2 F.) and at the middle 23 C. (73.4 F.). Ten minutes later the temperature at the middle was 24 C. (75.2 F.) and the dish was then returned to the oven. Cultures taken at various levels showed that the typhoid bacilli were alive even close to the surface.

In the next baking the oven was kept at temperatures ranging between 207 and 214 C. (405 to 417 F.). After half an hour the pan was removed. The surface was dark brown and the points sticking up from it were charred. The liquid around the margin was boiling vigorously and the whole dish was sizzling. The temperature just under the surface was 83 C. (181.4 F.). At the middle it was 28 C. (82.4 F.) and near the bottom it was 48 C. (118.4 F.). An hour later the temperatures had become nearly equalized and were 46 C. (114.8 F.) near the top, 42.5 C. (108.5 F.) at the middle, and 43 C. (109.4 F.) near the bottom. This showed that the interior of the dish did not reach even a pasteurizing temperature.

Cultures taken at the surface soon after the pan had been removed from the oven showed no typhoid colonies and very few of other kinds. Cultures taken at a distance of half an inch from the surface showed a few colonies of the typhoid bacillus, most of the organisms having been killed. Cultures from a depth of 2½ inches showed abundant colonies of typhoid bacilli. In these cultures the typhoid colonies were identified by their appearance on Endo medium and Russell medium and also by agglutination by anti-typhoid serum.

In this way it was shown that sterilization of the pan of spaghetti at the dinner in Hanford was not only improbable but practically impossible. The mass of the spaghetti there was much greater than in the experiment and conditions were less favorable for thorough baking.

The thickened sauce, consisting so largely of milk, was suspected of being the culture-medium in which the multiplication of the typhoid bacillus took place. Ten c.c. of the sauce, which had been set aside when the experimental dish was prepared, was put in a test-tube and sterilized in the autoclave. The same amount of sterilized milk was used for comparison. Each tube was inoculated with 0.0001 c.c. of a twenty-four hour broth culture of the typhoid bacillus isolated from Mrs. X. The tubes were thoroughly shaken and then incubated at 37 C. (98.6 F.). Table 3 shows the number of bacilli present in each cubic centimeter of the sauce and the milk at the time of inoculation, and after twelve and twenty-four hours of incubation.

TABLE 3.—COMPARISON OF THE SAUCE AND MILK AS CULTURE MEDIUMS

Hours of Incubation at 37 C.	Number of Bacilli in Each Cubic Centimeter		Percentage Increase in the Number of Bacilli	
	Sauce	Milk	Sauce	Milk
0	850	1,250	0	0
12	25,000,000	57,000,000	2,940,000	4,560,000
24	74,000,000	56,000,000	8,700,000	4,480,000

From Table 3 it is readily seen that the sauce is a good culture-medium for the typhoid bacillus, although it is somewhat inferior to sterilized skim milk, as is shown by the less rapid multiplication in the sauce during the first twelve hours.

The laboratory experiments completed the explanation of the Hanford outbreak by showing that the sauce used in making the Spanish spaghetti was a good culture-medium and that the dish had not been sterilized after leaving the house of the typhoid carrier.

Moreover, it was demonstrated that cooked dishes must be considered as possible conveyers of infection unless it can be shown that the method of cooking would produce complete sterilization. The slowness with which heat penetrates dishes like the Spanish spaghetti shows that very prolonged heating would be necessary for sterilization of large dishes of such food. Ordinary baking merely incubates the interior of these masses of food.

THE PREVENTION OF SECONDARY CASES

April 6, Dr. C. L. Scott, the city and county health officer, requested the State Board of Health by telegraph to take charge of the vigorous clean-up campaign which had been recommended as necessary to prevent secondary cases. Under the immediate supervision of Sanitary Inspector E. T. Ross of the State Board of Health, eight men inspected the premises of the entire city and ordered such alterations as were necessary.

The work was finished on April 24. The city and county officials and the individual citizens cooperated with the inspectors to such an extent that in no instance was it necessary to prosecute a property owner in order to have a nuisance abated. The city

continued the employment of one sanitary inspector after the campaign was finished.

Secondary cases were almost completely absent up to the time of the preparation of this report, three months after the dinner which caused the epidemic. One case of typhoid fever was reported, and the date of onset was given as May 10. The attending physician could discover no relation between this case and those infected at the dinner. No other cases have been reported.

In order to lessen danger of further infections from this carrier, various precautions were laid down by the State Board of Health and agreed to by Mrs. X in writing.

CONCLUSIONS

1. The source of infection in the ninety-three cases of typhoid fever in the Hanford epidemic was a typhoid carrier who prepared food served at a public dinner.

2. The vehicle of the infection was a large pan of Spanish spaghetti prepared by the carrier. This dish was baked after it had been infected, but this baking was shown by laboratory experiments to have incubated the bacteria instead of sterilizing the food. Certain customary methods of cooking are thus shown to be inadequate as a protection against infection.

3. The incubation period in the majority of the cases in this epidemic of typhoid fever proved to be shorter than the time usually regarded as the minimum. The first case developed three days after infection. More cases showed their first definite symptoms six days after the infected food was eaten than on any other one day.

4. The ways in which a carrier may transmit infection are so varied and so numerous that attempts at the control of mere channels of infection will not offer sufficient protection. Those who were suspicious of the raw salad at the dinner in Hanford and ate the freshly baked spaghetti turned from a safe dish to one which was heavily infected. The best protection against carriers will come through thorough investigation of the source of infection in every case of typhoid fever. When carriers are discovered, they can be advised and controlled.

5. Until there are more trained epidemiologists on a full-time basis among state and local health officials, the danger from carriers will not be noticeably diminished, and the individual will find in antityphoid vaccination his best protection against infection from carriers.

Labor Camp Sanitation.—The New York State Department of Labor has promulgated a set of rules and regulations governing the sanitation of living quarters and camps. The most important of these rules are:

The roof and walls of living quarters must be water-tight. The floor of every room used for sleeping purposes must be built of wood, asphalt, or cement. If built of wood, it must be raised at least 1 foot from the ground and the boards must be planed, tongued and grooved and at least ¾ inch in thickness. If built of asphalt or concrete, it must be laid on a solid foundation other than earth and must be at least 2 inches in thickness. All such floors must be given a smooth, non-absorbent finish.

In every room used for sleeping purposes there must be provided a minimum of 400 cubic feet of air for each person over 14 years of age, and 200 cubic feet of air must be provided for each child below this age. All living quarters other than tents must have at least one window opening directly to the outer air. These windows must be easily opened and have a minimum area of 4 square feet. Ventilation must be adequate. No bed or bunk may be placed one above the other. Finally, all labor camps must be provided with living quarters, kitchen and dining room accommodations under shelter and plenty of water for drinking and bathing purposes must be furnished in every camp.

BLOOD TRANSFUSION BY THE SYRINGE CANNULA SYSTEM *

EDWARD LINDEMAN, M.D.
NEW YORK

The time allowed for a paper under the present circumstances will not permit of a full discussion of the subject in hand. I therefore omitted a summary of the literature, the excellent work of others in this field, problems of technic, questions of accidents, etc. I will confine myself to some of the principles involved in blood transfusion and speak of some of its applications.

When one considers the many facts about the blood, not generally recognized, which are known, and the many facts yet to be learned, one cannot help but realize the complexity of this tissue. Many diseases produce changes in quantity and quality of the blood. Changes in quantity and quality of the blood are responsible for many pathologic conditions. Failure on the part of the blood to modify its quality properly and adequately to meet the required demands in the various conditions is frequently responsible for the existence of disease, especially infections. It is only by a thorough study of this complex tissue in the normal and by a study of this tissue under pathologic conditions that one may obtain a clear conception of the possibilities of blood therapy. Further studies of the mode of operation of substances and elements of the blood in disease will perhaps suggest to us possibilities in modifying the blood of a donor or patient to meet the needs of the case and make more potent the agencies involved in overcoming disease. These studies are necessary not only that we may know when and how to apply blood therapy but equally important that we may know when not and why not to employ it.

Permit me to take up with you some of the conditions in which blood transfusion therapy may be considered.

Aplastic Anemia.—A disease usually of young adults, short, febrile course and always fatal. The anemia is progressive with no remissions of the disease, and the termination is usually in hemorrhage. In this disease leukoblastic and erythroblastic activity becomes completely and permanently paralyzed. The introduction of fresh blood is wholly inadequate to modify favorably the course of the disease. This statement is based on three cases in my own experience with a support of the literature among the reliable authors.

Splenic Anemia with Hematemesis.—In this group we may for our purposes include Banti's disease. In many cases syphilis plays a prominent rôle. Where syphilis prevails and the anemia is in excess of the blood lost, transfusion will be of little aid until the patient has received antisyphilitic treatment (case report[1]). After receiving such treatment, transfusion in severe cases is specific. Following the combined therapy splenectomy deserves respectful consideration.

Gastric Ulcer with Hemorrhage and Anemia.—In traumatic hemorrhage or hemorrhage from ulcer, nature provides two factors of safety in checking

---

* Read before the Section on Practice of Medicine at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Lindeman, Edward: Blood Transfusion, The Journal A. M. A., March 28, 1914, p. 993.

it: (1) a fall in blood-pressure, and (2) a decrease in coagulation time. The decrease in coagulation time is brought about by dilution of the blood with fluid of the tissue. This fluid carries with it tissue extract. Tissue extract reduces coagulation time. If transfusion be contemplated it should preferably be done after all bleeding has ceased, and a sufficient time allowed for a crust to seal over the bleeding area. If both operation and transfusion be done, transfusion should preferably be done first whether the patient is actively bleeding or not. Anesthesia and operation should immediately follow. The patient will bear the anesthesia well, the shock of operation will be prevented; sensory and other reactions which occasionally follow transfusion never become manifest, and a poor surgical risk is converted into a good one. My experience is that when the hemorrhage is profuse and several occur within twenty-four or thirty-six hours, the ulcer is likely to be a deep one. These are naturally more liable to perforate. In these cases transfusion and operation should be done without delay.

The treatment of severe hemorrhage by blood transfusion is specific. The results when proper transplantation is accomplished are nothing short of brilliant.

Alcoholic Cirrhosis of the Liver with Severe Secondary Anemia.—The liver cirrhosis is no contraindication. The results are good. Ascites may follow transfusion, but this ascites clears up later. My patients have all done well even when syphilis was associated. In liver disease Whipple found a diminution in the fibrinogen of the blood. The purpuric eruptions and also hemorrhages which not infrequently accompany the disease may thus in a measure be easily accounted for. Where varicosities of veins prevail both factors may be operative in causing hemorrhage and anemia. Hence the rational procedure for the relief of the condition is the transfusion of whole blood.

Acute Leukemias.—I have had no success in the treatment of this disease, in either the proliferative or destructive forms, with or without hemorrhage.

Hemophilia.—A family disease following the law of Nasa. Here we encounter a condition of the blood which permits of a greatly delayed coagulation time, the blood failing to clot in over one hour. In the circulating blood fibrinogen, calcium salts, prothrombin and antithrombin are constant constituents. Antithrombin holds the prothrombin in combination and prevents its conversion or activation into thrombin. When blood is shed the disintegration of platelets furnishes material called thromboplastin which combines with the antithrombin and the prothrombin is liberated. Prothrombin freed is rapidly changed to thrombin and in the presence of calcium salts converts fibrinogen into fibrin (Howell). From the most recent researches of Howell in hemophilia, the condition is associated with a decrease of prothrombin which necessarily means a relative increase of antithrombin. In this disease two conditions are corrected by blood transfusion: (1) prothrombin is supplied; (2) the lost blood is replaced. Human blood-serum in sufficient quantities will supply enough prothrombin to stop the bleeding. Blood-serum will not replace the formed elements of the blood lost. Hence, in severe cases blood transfusion is the measure of choice and should be performed during the active stage of bleeding. In some cases it might be considered as a prophylactic after all bleeding has ceased. After transfusion the coagulation time is materially reduced but, curiously enough, does not remain constant. A case may illustrate this point:

A typical case in the series of Dr. W. Gilman Thompson, Bellevue Hospital, in a man, aged 29, with multiple hematoma in joints, loose tissues of the neck and floor of the mouth. His life was endangered by strangulation May 22, 1913, coagulation time over 45 minutes; May 23, 230 c.c. was transfused; May 24, coagulation time 17 minutes; May 25, coagulation time 19 minutes; May 25, 200 c.c. was transfused; May 28, coagulation time 12 minutes; May 29, coagulation time 14 minutes; May 30, coagulation time 15 minutes; June 2, 200 c.c. was transfused; June 4, coagulation time 8 minutes 10 seconds. Patient had no recurrence of bleeding since the second transfusion until one year later, when he came to my office with a hematoma of the left wrist. His coagulation time was then a little over one hour when an imperfect clot had formed. He was then transfused again with good result. Dr. Crile, in a personal talk, informed me that some of the cases in his experience remained in a normal condition for several years after treatment.

Simple Anemia of Grave Degree of Unknown Cause.—Most common in girls and young women between 10 and 20 years of age, frequently fatal. The coagulation time is slightly delayed, menstruation is irregular and at times a little excessive. Epistaxis is occasional. The anemia is frequently fatal and yet shows none of the characters of pernicious or aplastic anemia or hemophilia. In cases in which the usual forms of treatment have been exhausted with no improvement, striking results are obtained with blood transfusion. After overcoming some of the anemia by blood transfusion, the patient, who has previously shown no hematopoietic function, begins to make new blood. However, the anemia must be overcome to a considerable degree before the patient is capable of blood regeneration. Not only does the new blood correct the pathologic condition in part but apparently stimulates hematopoiesis. We may well apply here the maxim, *Ex nihilo nihil fit*, "Nothing can be made out of nothing." This stimulation is probably due to the increased nutritional condition of the hematopoietic organs themselves, which nutriment furnishes material from which new blood may be made. Once the patient assumes good hematopoietic activity the road to recovery is rapid and cure is complete.

Postoperative Cholecystotomy (where bleeding from the wound cannot be controlled).—Human serum in large quantities may help. In some cases, however, this may not help and transfusion of blood is necessary. In severe cases it may be necessary to transfuse every day or every other day or every three or four days according to the variation in coagulation time and variations in the blood lost. If the patient's blood coagulation time is maintained within eight minutes all bleeding will cease; but at this point the patient remains at a low level of safety. Hence, though bleeding has ceased, a lower coagulation time should be aimed for. A severe anemia from preceding illness may be present and a relatively small hemorrhage can produce grave symptoms. Whole blood adequately satisfies all the necessary needs of the case. According to Falta, also King, bile pigments have considerable affinity for calcium; when the pigments appear in the circulation the heart muscle rapidly gives up some of its calcium. In consequence the heart action is impaired. In this condition, as

well as in some cases of pernicious anemia, I usually use Locke's modified Ringer's solution, without the dextrose, for improving, if possible, this cardiac tone. The solution is used in place of saline.

Carcinoma and Sarcoma.—The fact that malignancy is common in some families and absent in others, and the fact that tumors are not transplantable in all individuals of a species, would lead one to conjecture the possibility that inhibitory substances may be present in some individuals and that these substances reside in the blood. Crile has reported a cure of sarcoma in a dog by blood transfusion from an immune animal. In my experience thus far I have no evidence one way or another. The operative risk, as in many other conditions, is undoubtedly diminished by blood transfusion.

Malnutrition.—The life of a starving animal cannot be maintained by the transfusion of blood from a normal, well-fed animal. The bulk of the energy represented in the blood is in a potential form. That which is kinetic is relatively small. Hence, one cannot hope for much in cases of malnutrition in infants. I have had a little success in this field, but I feel that what virtue it may possess must lie in its stimulating quality. Of course, when anemia is associated, the results in some cases should be good. In the majority of cases of malnutrition in infants, in spite of the pallor and emaciation, the red cells and hemoglobin approach very close to normal, sometimes even higher. This is a little difficult to understand. There may be a reduction in volume of the blood due to dehydration of the tissues, and the anemia may be masked by concentration. This, however, is a theoretical point, and deserves no place here.

Purpura Hemorrhagica.—The condition may be primary, or may be secondary to some accompanying or preexisting disease. We may divide them conveniently for our purposes into four groups: (1) cases associated with diminution of platelets; (2) cases associated with diminution of fibrinogen; (3) cases associated with diminution of prothrombin; (4) all other cases.

Groups 1, 2 and 3 are either improved or cured by blood transfusion. As to Group 4, the condition or course of the disease in many of the cases in this group is not modified.

Sepsis.—I must here cite one case, a patient referred to me through the kindness of Dr. F. S. Meara of New York:

A. H., aged 11 years. Diagnosis: Rheumatic fever with malignant endocarditis. Child is very ill, emaciated, very weak, anemic; hemorrhagic mucous membranes; petechiae on skin and blood in stools. Systolic murmur of mitral insufficiency; liver and spleen just at the level of umbilicus, and some edema of extremities. For the past eighteen months child has been ill with the following diseases in succeeding order: asthma, tonsillitis, rheumatic fever, bronchopneumonia, diphtheria, otitis media, mastoiditis with involvement of sphenoid bone, and is now suffering with the disease mentioned above. In spite of repeated negative blood-cultures, it was felt that the child had a blood infection, from some obscure focus, probably the heart valves.

July 18, 1913: Strong positive complement fixation test to *Strepococcus viridans* (Research Laboratory, Department of Health, New York); 280 c.c. of blood was transfused in median basilic vein from father. Time three minutes. One hour later temperature 101 F.; normal in evening.

August 1: Second transfusion; 360 c.c. of blood was transfused from father. Time from beginning to end of operation twelve minutes. No reaction.

August 8: Third transfusion; 260 c.c. of blood was transfused from father. No reaction. Mastoid wound previously showed little tendency to heal, but now shows increased granulations and decreased discharge.

August 15: Fourth transfusion; 220 c.c. of blood was transfused from father. No reaction.

August 21: Red blood-cells, 2,700,000; hemoglobin, 70 per cent.

August 22: Fifth transfusion; 260 c.c. of blood was transfused from father. Fifteen minutes later there was a slight general urticaria. After this transfusion child made rapid progress in strength and increase in appetite.

August 29: Sixth transfusion; 280 c.c. of blood was transfused from father. Fifteen minutes after this transfusion child developed a general urticaria. First transfusion was followed by chills and slight temperature. No chills and no rise of temperature followed the succeeding transfusions.

September 5: Child began to go out in an automobile daily. Her course has been one of continuous progress ever since. Convalescence dates from August 29, the day of the last transfusion.

November 22: Child is now practically well save for occasional attacks of asthma for which she is sent to a warmer climate.

December 1: Condition good.

Aug. 1, 1914: Condition excellent. Child weighs 90 pounds. No recurrence of the disease.

In the analysis of the case of A. H., and in the explanation of the successful results obtained, I desire to advance the following statements which I present in the form of a theory:

In this case it might be said that three prominent conditions prevailed:

1. Chronic sepsis.
2. A severe anemia secondary to sepsis.
3. Multiple purpuric hemorrhages secondary to sepsis.

[From observations in this case and from observations in nine other cases of chronic sepsis, I am convinced that blood of a normal healthy individual contains bactericidal elements or elements that inhibit bacterial growth, that possess considerable potency. These elements when introduced convey some degree of passive immunity.

THEORY

"This immunity follows the law of passive immunity and is greatest at the time of introduction of blood, and gradually disappears with time either by elimination or modification. If this be true the introduction of fresh blood will inhibit septic processes for a time at least until the bactericidal or inhibition substances introduced become impotent. At this point bacteria may assume their previous activity and the condition is unrelieved. However, if blood is introduced repeatedly, this bacterial activity will be checked in part.

The parallelism of anemia and low resistance to infection is a well-known fact.

When a sepsis produces an anemia a vicious cycle presents which prevents the host from developing active immunization to the infection.

If we assume a certain threshold necessary in the host, in terms of red blood-cells and hemoglobin for the production of an active immunity, then repeated transfusions will check septic processes and overcome the anemia to a degree that will enable the host to develop his own active immunization which will destroy the organism causing the disease."]

It takes more than one swallow to make a summer. And, in support of my contention I have had nine other cases of sepsis in which there were two deaths.

In one case in which death occurred a child of 6 years had appendix abscess and spreading peritonitis and gangrene of the cheek. In the other case a man aged 39 had a streptococcus septicemia. The blood culture yielded 200 colonies per 3 c.c. of blood. These cases will be published in detail elsewhere. The literature of many experimental workers would seem to bear out this contention. Von Behring, Fodor, Nuttal, Nissen, Buchner, all showed that fresh normal blood and blood serum will kill bacteria in a reagent glass. Lemaire and also Buxton found that after the infection of pathogenic micro-organisms directly into the circulation there is first a reduction in their number followed later by an increase. It is supposed that the natural antibactericidal forces of the serum and leukocytes take up the destruction of the bacteria until the former are exhausted, and from this time proliferation will take place without hindrance. In typhoid infection it would seem that the first organisms which reach the circulation are killed. In this destruction there is a great loss of bactericidal agencies, so that continued invasion results in general infection. Evidence is abundant that the blood is endowed with a natural protection against the invasion of bacteria, and in most of us it is only when infected by an organism of high virulence that we are overwhelmed. If, however, by the removal of the natural immune substances through long illness, alcoholism, bad habits, etc., an individual may be wholly incapable of warding off infection, even of low grade virulence, and chronic sepsis may easily ensue. The increased bactericidal power of the serum which develops in immunization or infection is an index of the increased resistance of the individual against infection. If this be true the reverse must be true, and where there is no bactericidal power in the blood there is no resistance to infection. In streptococcus and staphylococcus infections, protective serums have been obtained in laboratory animals, but the quantity required for use in man at the present time precludes the possibility of application. The defense of the body against streptococci depends on the power of the leukocytes as well as the opsonin and other bactericidal substances of the serum. Hence the bactericidal power *in toto* resides in the whole blood.

40 East Forty-First Street.

ABSTRACT OF DISCUSSION

DR. G. M. DORRANCE, Philadelphia: The published results from transfusion in pernicious anemia, and my own results agree with them, have not been favorable in cases in which only one transfusion of a large amount is performed. Exceptional cases of course occur. We have had two cases of cure, both in young subjects, and several cases in which transfusion was successful in the first instance but was followed by death several months later. The syringe method of which Dr. Lindeman is an advocate seems to be destined to supersede the direct connection between artery and vein and from vein to vein. This method has been used for several years by Drs. Cooley, Edwards and others, the difference being that they use a larger syringe. We have not had experience in the treatment of chronic infections by frequent transfusions, but in acute infections the use of blood-serum or one large transfusion has not altered the course of the disease in any of our cases. In most melena cases, serum, foreign or human, usually controls the bleeding. In a few very severe cases transfusion is indicated. Too much care cannot be exercised in the selection of the donor in order to rule out syphilis, tuberculosis, etc.

DR. S. ADOLPHUS KNOPF, New York: Will Dr. Lindeman tell us what has been his experience with tuberculosis cases and how the patients felt after transfusion?

DR. A. E. JAFFIN, Jersey City: Five years ago I transfused a patient with pernicious anemia by the cannula method, and although the patient died three days later the hemoglobin rose 20 per cent. Coincident with this rise in hemoglobin there was cardiac distress that stopped us from going higher. As an intern I recall cases of malignant endocarditis that were repeatedly transfused shortly after Dr. Crile had revived the subject. The success we had then was not as marked as Dr. Lindeman's now. In one case there was a streptococcus invasion of the mitral valve.

DR. E. LINDEMAN, New York: In the technic, specially devised cannulas are painlessly inserted into veins of the donor and patient, without skin incision. About 15 syringes are employed. No syringe is used a second time until thoroughly cleansed. One operator manages the syringe of the donor, another that of the patient. One syringe is being filled while another is being emptied. A little saline is allowed to trickle through the patient's cannula every now and then to prevent the possibility of any coagulation in the cannulas. The syringes are passed from donor to patient in rapid succession until the desired quantity of blood has been transfused. The system thus operates as an artificial human heart. It requires from six to twelve seconds to fill and empty a syringe. The largest quantity I have taken from one donor in one sitting is 1,500 c.c.; the time required was fifteen minutes; 30 c.c of saline was used. The coagulation time of blood carefully drawn into a syringe is never less than five minutes. Hence, no change can take place in the blood during the transfer, for the entire blood-mass, regardless of the amount, is outside the human body for a period of less than twelve seconds. In speaking of sepsis, I tried to emphasize the fact that we have, in the circulating blood of normal healthy persons, natural bactericidal substances more powerful than any substances in the pharmacopeia at present capable of being injected into the circulation for the treatment of many infections. Undoubtedly, the degree of natural immunity will vary with many persons, as Dr. Park has shown in the protection from diphtheria; some possess it, others do not. In the selection of donors, those who have proved successful in septic cases are used for similar cases. For the treatment of typhoid fever donors are kept immunized during the typhoid fever season. In answer to Dr. Knopf's query concerning transfusion in tuberculosis, I must beg to decline to make a statement at present. The work is being pushed as rapidly as possible and a report will follow in due time. I have purposely omitted the subject of pernicious anemia, yet there is perhaps no disease that presents itself more frequently to one engaged in the field of blood therapy. Cases referred to me from time to time now make a large series. These have been subjected to a critical analytic study. Because there is so much to be said on this subject I have preferred not to enter on it at this time. When the patient, however, has reached a critical condition, when all other forms of treatment have been exhausted, there is no therapeutic measure known that has any parallel in efficacy in robbing the disease of much of its terrors as blood transfusion when properly applied.

Characteristics of the Health Movement.—The New Health is thus an index of our civilization, a composite result of all our well-being and a tremendous asset for the advancement of that well-being. Health is economic. Sound men cannot be exploited; and for that reason, if for no other, I greet with enthusiasm the advent of the New Health. Health is moral. Sound men will not be unjust and for that reason I salute the era of the New Health. Health is civic. Sound men will eliminate poverty and that of itself should make us all sanitarians. Sound men will learn to do without jails, recognizing that so-called criminals are properly candidates either for an educational reformatory or for a custodial hospital, and therefore again I turn gladly toward the dawn of the New Health.—Edward T. Devine, *Journal of Outdoor Life.*

ACUTE MYELITIS, SECONDARY TO PERIRECTAL ABSCESS, DEVELOPING A FEW HOURS AFTER SEVERE FRIGHT *

WILLIAM G. SPILLER, M.D.
Professor of Neuropathology, University of Pennsylvania, Department of Medicine
PHILADELPHIA

Fright has been considered, especially by German authors, a cause of organic paralysis, and cases with this etiology are reported in the older literature. It is probable that many of these cases were instances of functional paralysis and not organic. In 1903 I had the opportunity of studying a case in which a struggle with burglars was followed in two days by paresthesia of the lower limbs of sudden onset and some days later by motor and sensory paralysis of these limbs and then death. Pus within the abdomen extending from the rectum and severe myelitis were found. The fright may have had no connection with the paralysis, but on the other hand it may have disturbed the circulation in the spinal cord and in connection with the exertion caused by the struggle have rendered the cord more liable to infection.

H. E. S., white, first came to the nervous dispensary of the University Hospital, Nov. 9, 1900. He was a railroad conductor, aged at that time 35 years. While coming from Omaha he had become paralyzed in the right side of his face after he had been sitting by an open window. The paralysis was severe, and the entire right side of the face was affected. He made a complete recovery from this paralysis.

April 22, 1903, he returned to the nervous dispensary, when the following notes were taken: He had been perfectly well since he had had the facial palsy. He denied venereal disease. He had been married five years, from 1891 to 1896, but his wife had never been pregnant.

During the night of April 17, 1903, he was attacked while in an eating-house. He was the proprietor of this restaurant and at 1 o'clock in the morning three men entered his place of business and tried to rob him. With the assistance of another man who was in the place, he succeeded in driving off his assailants and it is very certain that he was not injured bodily in any way, although he was very much excited.

During the afternoon of April 19 he was sitting by a window in his house. He had been perfectly well until this time. While he was sitting by the window the man who had assisted him in expelling the robbers passed and the patient's thoughts were directed to the attempted robbery. Soon after the man passed he rose from his chair but noticed that both of his legs were asleep, as he expressed it, and he walked therefore with some difficulty. The paresthesia has persisted until the present time. When he first experienced the paresthesia his feet and right leg seemed numb, and gradually the numbness spread to the knee on the left side and to the hip on the right side, implicating also the penis, scrotum and gluteal region. The rest of his body seemed normal. He knows when he has passed urine or when the rectum should be emptied, but he cannot feel the passage of the urine or feces. He has not had involuntary micturition or defecation. He has not had any sexual desire or seminal emission since his symptoms first appeared, but the time has been short. He tires very readily and needs to make more effort to perform voluntary movements. The station is fair even with eyes closed.

Standing on the right leg alone is not so easy as standing on the left leg alone. He moves all the joints normally. He can place his heel at any desired point with fair accuracy. Objective sensation in its different forms is little if at all affected; when tested he occasionally gives an incorrect answer, but soon corrects himself. He complains that he feels as though he were walking on felt and that he does not seem to have shoes on.

Both patellar and Achilles tendor reflexes are normal. In testing the Babinski reflex the large toe seems to go up first and then to go down. The reactions of the irides are normal.

April 27: The Babinski reflex is positive on each side.

May 2: Since Sunday, April 19, the patient had been able to walk without difficulty and came to the dispensary, although his gait was slightly ataxic. The toes of each foot had been forcibly extended from irritation of the sole of the foot. He had no marked disturbance of gait until Thursday morning, April 30, when, about 11 a. m., he fell to the floor but was able to pull himself on the sofa. He had not passed urine since half past five of that morning. So soon as he climbed on the sofa he began to have pain in the lower part of the abdomen. Dr. Lindauer was sent for and catheterized the patient. The man had not had any pains in the lower limbs at any time although he had pain in the lumbar region. Bowels have not moved since April 30.

About 2 p. m., April 30, the patient succeeded in rising from the sofa and by supporting himself was able to pass into another room on the same floor. He sat in a chair three-quarters of an hour. Later he walked into the front room and walked several times about the room until he was brought to the University Hospital about 6 p. m., April 30.

Friday, May 1, the morning after admission to the hospital, he was able to stand and he walked around the bed. Dr. Nisbet, about 3 p. m. of this day, had the patient get out of bed and stand by the side of the bed, supporting himself slightly with one hand. As he was unable to void urine while standing, he was catheterized.

Resistance to passive movements in the lower limbs was nearly normal, and he could flex and extend the leg and thigh even when these movements were resisted. The patellar reflex was exaggerated, especially on the right side. Ankle-clonus and Babinski reflex were distinct and both were more marked on the right side. Tenderness to pressure over the vertebrae was not felt.

Condition May 2: The lower limbs are not at all atrophied but are completely paralyzed, so that there is scarcely any movement in the toes or hips. The patellar reflex on each side is not so prompt as it was yesterday; it is about normal on the left side and slightly below normal on the right side. Ankle-clonus is persistent and typical on each side, but more pronounced on the right side. Babinski's reflex is very distinct on each side; on the right side the movement of the big toe upward is typical and slow; on the left side the movement of the big toe upward is of the same quick character as it was last week. The lower limbs are cool to the touch and are spastic.

Tactile sensation is much impaired in the lower limbs, beginning about 2 or 3 inches below a line passing through the umbilicus. The outer part of the right thigh and the feet are almost anesthetic. Pain sensation is acute in the lower limbs except on the outer side of the right thigh, but is not so acute as in the upper part of the trunk. Sensation for temperature is much impaired in the lower limbs and over the abdomen below the umbilicus, but the sensation seems to vary during the examination. The abdomen is very rigid and painful to slight touch.

The movements of the upper limbs are free and the motor-power is normal. The grasp of each hand is normal. Sensation for touch, pain and temperature in the upper limbs and face is normal.

The reaction of the iris to light and in convergence is prompt in each eye. The movements of the eyeballs are normal in all directions. The tongue is protruded in the median line. The muscles of the facial and motor trigeminus supply are normal.

May 3, 2 p. m.: The lower limbs are completely paralyzed. The patellar reflex is absent on each side even on reinforcement. Babinski's reflex is present on each side. Ankle clonus is not obtained on either side. The abdomen is rigid and tender. Sensation for touch in the right lower limb is lost on the outer side below the crest of the ilium, on the anterior side below Poupart's ligament, on the inner side

* Read before the Section on Nervous and Mental Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

below the patella, and on the posterior side below the popliteal space. In the left lower limb tactile sensation is impaired below the knee. Pain sensation in the right lower limb is lost on the outer side below the trochanter, and on the inner and outer surfaces of the leg below the patella, and is impaired in the rest of the right lower limb. It is lost in the outer part of the left leg 2 inches below the patella to 2 inches above the ankle.

Heart and lungs are normal.

May 5: The upper limbs are not at all affected. Respiration is entirely costal; the abdomen is distended. Since yesterday morning the patient has been having intense pain over the trunk back and front from about 4 inches below the nipples to the inguinal region. The whole spinal column from below the spines of the scapulae is very tender to pressure. Sensation for touch and pain is entirely lost in the lower limbs and abdomen as high as a line about 2 inches below the umbilicus. Patellar reflex and Achilles tendon reflex are completely lost on each side. Babinski's reflex is still very distinct on each side. The man has frontal headache. He complained of a sensation of fulness in the bladder which was removed by catheterization.

Death occurred May 9, 1903.

The necropsy was performed by Dr. William S. Wadsworth, coroner's physician. He reported that the findings showed such clear evidence of gradual extension from the region of the rectum that he gave as cause septicemia by extension of infection from the rectum. Dingy greenish pus was found in the tissues about the rectum with emphysema and cellulitis extending to the buttocks above the brim of the pelvis, implicating the retroperitoneal space and the lymph-glands of the abdomen, extending as high as the pleura, following the nerves to the spinal cord, and causing general peritonitis. There was evidence of beginning pleurisy. The bladder did not contain pus.

Dr. J. S. Evans, Jr., reported, May 16, 1903, that intradural cultures were negative, subcutaneous cultures were contaminated, but a culture taken the day before death from the area of cellulitis of the buttocks showed the presence of the *Streptococcus pyogenes.*

My findings in the spinal cord were as follows: Lumbar Region: A section from the midlumbar region showed much softening although it was possible to distinguish white from gray matter. The anterior and posterior roots stained deeply by Weigert's hematoxylin method. The nerve-cells of the anterior horns were much diseased; by the thionin stain, they contained few chromophilic elements, and had very imperfect dendritic processes. The nucleolus stained deeply and it was a little difficult to make out the nuclear membrane. In some of the cells of the anterior horns the chromophilic elements had entirely disappeared. There were recent hemorrhages at some places in the cord, but no accumulation of pus-cells could be found in the cord. Sections from the lower thoracic region showed more disintegration than did those from the lumbar region, and it was impossible to distinguish here white from gray matter. Collections of round cells were seen within the cord.

There was diffuse staining with the Marchi method in the lumbar region and to some extent in the thoracic region, but it was not intense.

The nerve-cells of the anterior horns in the cervical region were much diseased. They stained deeply, were shriveled, had few processes, and in some the nucleus was peripheral. The anterior and posterior roots were normal in the cervical region.

The fright in this case was very pronounced. Could it have had any relation to the paralysis?

The tendency is to attribute all acute paralyses developing immediately after fright to hysteria, and this tendency is justifiable in most cases; but there is a possibility that fright may act as an *agent provocateur,* in the sense of French writers, and be a cause of organic change. Papers bearing on this subject are found chiefly in the older literature. In many instances the fright is only a coincidence, but in others it may affect the circulation in vessels already diseased. When syphilitic endarteritis has occurred in the vessels of the cord, apoplectiform myelitis has been observed not infrequently. I have already written on this subject.[1] Paralysis under such circumstances may develop within half an hour without any apparent exciting cause; how much more probable is paralysis, therefore, when severe emotion disturbs an impaired circulation. Blushing shows chiefly in the face and may be intense as a result of mild emotion, but the blushing is not confined to the face and may affect a large part of the body. Are the interior organs implicated in blushing? It is at least possible. A congestion of the vessels of the spinal cord from vasomotor disturbance when those vessels are diseased may cause thrombosis, and this certainly may cause paralysis, or, if the thrombosis be mild, the vitality of the affected part of the cord may be reduced and the susceptibility to toxins may be increased. One may well hesitate at the present time to accept as proved acute organic paralysis as caused by fright in cases in which the vessels are in normal condition. It may be well to review briefly some of this older literature on fright paralysis.

Kohts[2] refers to fright as a cause of exophthalmic goiter, icterus, turning white of the hair, and cerebral apoplexy. He had an unusual experience in that he was able to observe a great many cases of nervous and other disease that developed during the severe bombardment of Strassburg. During the thirty-one days of the siege the town was bombarded almost every night; 193,722 bombs were thrown into the city, and after the surrender only two houses showed no marks of the firing. Kohts reports cases of paralysis agitans, and of myelitis and other diseases which developed immediately after severe fright, one of which was with necropsy. The people of the city took refuge in the cellars, and repeatedly saw those about them killed. The effect of psychic trauma has probably never been more clearly shown. Kohts offers no explanation for the manner in which fright leads to organic disease. It is difficult to attribute such an array of cases to mere coincidence.

Since the investigation of emotional paralysis by von Leyden and Kohts, very little attention has been given to the subject, although their publications first appeared in 1873 and 1874.

The case of Todd,[3] described by him as emotional paralysis, is questionable as regards an organic basis, according to von Leyden.[4] Hine's[5] case was one of chorea of pregnancy developing after severe fright. The midthoracic region of the cord was softened. Pasque's[6] case was one of paralysis of the lower limbs cured by strychnin.

Leyden reported the case of a woman aged 21 who was awakened by fire in a house opposite the one in which she was. She was greatly frightened. Immediately after the fire was extinguished and she had returned to her bed, she experienced severe pain in the left leg. The following morning the left leg was weak and gradually spastic paraplegia developed. A

1. Spiller, W. G.: Jour. Nerv. and Ment. Dis., October, 1909.
2. Kohts: Berl. klin. Wchnschr., 1873.
3. Todd: Clinical Lecture by Beale, London, 1861.
4. Von Leyden: Klinik der Rückenmarks-Krankheiten, 1874, i, 173; 1875, ii, 181, 190, 430; Ztschr. f. klin. Med., 1880, i, 12; Berl. klin. Wchnschr., Feb. 20, 1905, p. 193.
5. Hine: Med. Times and Gazette, 1865, cited by von Leyden.
6. Pasque: Arch. de méd. belge., December, 1842.

diagnosis of thoracic myelitis from fright was made. The necropsy showed sclerosis in the midthoracic region of the cord.

The second case that Leyden reports was as follows: A girl aged 23, previously healthy, during the siege of Strassburg found on returning home that her house was on fire. Symptoms began immediately and gradually the lower limbs became paralyzed and contracted. The necropsy showed chronic diffuse myelitis with meningitis, the upper thoracic region was most affected.

Another case reported by Leyden is as follows:

A servant girl, aged 16, was greatly frightened by an attempt to rob a house. The two nights immediately following the attempted robbery she slept badly. On the morning of the third day following the psychic trauma, or more exactly, after sixty hours, the lower limbs became weak. Paresthesia soon appeared in both upper limbs as well as pain in both lower limbs, and the patient became unable to move any of her limbs and had flaccid paralysis with complete loss of sensation in all the limbs. She had retention of urine and incontinence of feces only during a few days, and the disturbance of the trunk disappeared, so that motion and sensation were lost except in the head, neck and trunk. She had no mental symptoms. Tendon reflexes became normal, and Babinski's reflex and electrical reactions were normal. The case described above Leyden regarded as functional, and the result of suggestive treatment demonstrated the correctness of this view.

Brieger[7] says that organic cases caused by fright or mental shock have been reported by Todd, Hine, Pasque and Berger, but all were without anatomic foundation. Leyden was the first to show that such a cause might produce tissue changes in the central nervous system. He refers to the case in which Leyden found sclerosis in the midthoracic region, and to another in which he found diffuse sclerosis of the upper and middle thoracic regions. Brieger knew of no other anatomic evidence at the time he wrote his paper. His patient was a prostitute, aged 23, who had the symptoms of lumbothoracic myelitis developing first within a few hours after she was much frightened by a drunken man. The necropsy revealed a myelitis in the upper lumbar and lower thoracic regions. The patient had had syphilis. Brieger says clearly that fright was the only cause of the myelitis. It was not syphilitic, because no signs of visceral syphilis were found, but the syphilitic infection and the irregular life had made her more vulnerable. Still one may suspect syphilis notwithstanding Brieger's opinion. He thinks that the fright may have caused a temporary interruption of the circulation in the spinal cord, the lumbar region of which was exhausted by recent prolonged dancing. Fright affects the stomach and may cause vomiting, loss of appetite, ulcer and hematemesis, and may affect the lumbar region, causing pollution, etc. It is questionable whether the explanation given by Brieger can be accepted. The necessity of frequent micturition preceding examinations is well known by students.

P. K. Pel,[8] writing in 1881, in describing this *Schrecklähmung,* said that while functional disturbance following fright is well known, other cases are observed in which disease of the spinal cord has followed fright. Such are the cases of Russel-Reynolds, Todd, Hine, Leyden, Kohts, Brieger and others. Such cases are rare. Pel's case seems to have been one of functional paralysis following fright.

A case reported by Daus[9] is a valuable contribution to fright paralysis. A boy, aged 14, was physically poorly developed, and was obliged to walk much, but was healthy until Nov. 16, 1901. On this day he was so greatly frightened by an automobile that without being struck by it he fell to the ground and did not lose consciousness. When he tried to rise he was unable to do so, and he was carried home and put to bed. He had severe pain in the feet and both lower limbs were anesthetic as high as the gluteal region, and he had rectal and vesical symptoms.

Daus says that the most commonly affected region in fright paralysis is the lumbar cord, and this is because of functional overuse of this region. In his case there was no evidence of sexual abuse, which I have known to be the immediate cause of paralysis from lesion of the spinal cord, but the boy had been much on his feet, and in this way may have rendered his lumbar region more susceptible, but one would suspect some undiscovered cause in addition to fright. His case seems to show that the epiconus region has especial vulnerability to *Schrecklähmung.*

I have known persistent paralysis of the lower limbs to develop rapidly in a man during the early morning following repeated sexual intercourse occurring the preceding night.

The literature that Daus refers to on *Schrecklähmung* is of ancient date. With the exception of Leyden's paper in 1905 and Daus' in 1903, the subject seems to have been ignored by almost all of the recent writers.

Emotion has seemed in some cases to be the cause of hemiplegia in a person previously healthy. Cases of this kind have been oberved by Babinski[10] and Oppenheim,[11] and another was reported by E. Frank.[12] A woman, aged 26, developed left hemiplegia after a severe fright. The paralysis was believed to be organic and the result of a pontine lesion. No cause for this hemiplegia could be determined; the heart appeared to be normal, and at first no signs of syphilis could be detected, but the Wassermann reaction was positive. Careful examination revealed small scars near the mouth, the result of a facial eruption at the age of 5 years. The history of corneal opacity at the tenth year was obtained. Hereditary syphilis seemed probable. It is not likely that a healthy vessel would rupture from an emotion, but a diseased pontine vessel might yield, and the blood leak gradually.

Urinary paraplegia has been discussed in the older literature, but now one hears comparatively little of it. The paper of T. J. Walker has attracted considerable attention. He observed three cases of acute ascending paralysis following longstanding chronic cystitis. Urinary paraplegia, as he calls it, he states has been recognized since 1833, when Stanley made a communication to the Medico-Chirurgical Society; but Stanley's case seems to have been different. In Walker's[13] case, the patient had a stricture of the urethra and chronic cystitis, and during an exacerbation he developed during a night numbness in the feet

7. Brieger: Ztschr. f. klin. Med., 1881, ii, 121.
8. Pel, P. K.: Berl. klin. Wchnschr., June 6, 1881, p. 325.
9. Daus: Monatsschr. f. Psychiat. u. Neurol., 1903, xiv, 65.
10. Babinski: Semaine méd., 1909, No. 1.
11. Oppenheim: Lehrbuch.
12. Frank, E.: Berl. klin. Wchnschr., June 21, 1909, p. 1154.
13. Walker, T. J.: Tr. Clinical Society of London, xxxviii, 80; Lancet, London, March 11, 1905, p. 636.

and some loss of power in the legs. The following morning he had paresis of the limbs up to the thighs. By the evening of the same day the paralysis had extended upward to the arms and thorax, and breathing was embarrassed. The symptoms rapidly progressed, and death occurred eighteen hours after their onset. So far as the author could remember, the catheter or bougie was not used during the last illness.

In Case 2 the patient had chronic cystitis. December 31, he had acute exacerbation of his bladder trouble with malaise and some fever, but the symptoms were not urgent. On the morning of January 4 he experienced uncomfortable sensations and feebleness in the lower limbs. By midday he had paraplegia. He died forty-eight hours after the first indication of paralysis.

In Case 3 there had also been chronic cystitis. The extension of the paralysis upward was rapid. Death occurred eighteen hours after the first appearance of paralytic symptoms.

Necropsy was not obtained in any of the three cases.

The literature referred to by Walker is not extensive. In addition to Stanley, who in 1833 directed attention to urinary paraplegia and explained it as reflex paralysis, Troja is said by Leyden to have stated that violent inflammation of the kidneys may produce an irritation of the nerves of the kidneys and the inflammation may extend to the spinal cord. Guel[14] upheld the nervous reflex view of urinary paraplegia. Leyden[15] believed that the lesion was myelitis. He assumed that the inflammation first passed to the nerves and neuritis so produced may lead to myelitis. Fenwick accepted Leyden's views, but there seems to be little or no pathologic study of these cases.

A case of rapidly fatal ascending paralysis in a man with pyuria and prostatic hypertrophy, but without necropsy, was reported by G. B. Buchanan.[16] It was suggested that the passage of an instrument in a patient, who had recently been losing health with his urinary system obviously diseased, might have induced an increased absorption of poisons into the blood, leading to a profound intoxication of the cord without giving any precursory signs.

Orr and Rows in several papers, and later in association with Stephenson,[17] have demonstrated that inflammation of the central nervous system is easily induced by infection of the ascending lymph-stream of nerves, and that the spinal cord and brain are exposed to infection in this way. Their experimental work has shown that infection of the lymph-system of peripheral nerves causes an ascending neuritis which spreads upward to pass over the posterior root ganglia and along the spinal roots to the cord. Any part of the central nervous system may be attacked by organisms or toxins passing up the nerves from infective foci, and the ultimate result of infection may vary according to the quality of the exciting cause.

The case which I report in this paper should, I think, be explained in the light of Orr and Rows' findings, and the myelitis should be regarded as secondary to the perirectal infection. It is not impossible that the liability to myelitis was increased by the fright which the man experienced. Ascending neuritis, however, has always been regarded as very uncommon.

2046 Chestnut Street.

14. Guel: Guy's Hosp. Rep., 1861.
15. Leyden: German Clinical Lectures, New Sydenham Society.
16. Buchanan, G. B.: Brit. Med. Jour., Jan. 20, 1906, p. 145.
17. Orr, Rows and Stephenson: Review of Neurology and Psychiatry, July, 1913.

ABSTRACT OF DISCUSSION

DR. HUGH T. PATRICK, Chicago: I would suggest to Dr. Spiller that if he will put in a sentence to the effect that myelitis is, after all, a nerve disease, he would do a lot of good. The authority of that statement, if he feels like making it, would be of advantage. I presume we have all had the same experience of having a diagnosis of myelitis made in a condition which is not really a myelitis. Dr. Spiller would, I know, be the one best fitted to handle this question, as he was one of those who investigated the matter of so-called myelitis. As a matter of fact I believe it is true that inflammatory or infectious myelitis is a decided rarity, and if Dr. Spiller would put the weight of his influence in this direction I think it would be very useful.

DR. FRANK P. NORBURY, Springfield, Ill.: Some recent experimental work concerning fear is that of Dr. Cannon of Harvard Medical School, on the study of the adrenals in states of emotion, especially fear, rage and pain. The experiments were on cats frightened by a dog. He shows a very close relationship in emotional excitement between the secretion of the adrenals and the reactions which follow, including blood-pressure. His papers were published in *The American Journal of Physiology*.

DR. C. D. CAMP, Ann Arbor, Mich.: Dr. Spiller's paper has a tremendous medicolegal importance if it proves that organic disease might result from fright. One point did not seem entirely clear to me, and that is, did Dr. Spiller's patient have the abscess before the fright, or did it develop subsequently?

DR. CHARLES K. MILLS, Philadelphia: As Dr. Camp has stated, this paper might have great importance medicolegally. It might even have some effect in enlightening the Supreme Court of the state of Pennsylvania on their expressed opinion that fright must not be taken into account in a court of law in cases of suit brought to recover damages for accident. That is one of the curious conditions in which we find ourselves in the state of Pennsylvania. This decision has probably had the effect of making the attorneys for the plaintiff extremely careful about bringing the question of fright into the issue, causing them to dwell more on the effect of the reception of contusions, lacerations or other physical injuries which might be made the basis for damages. I am familiar with the paper to which Dr. Norbury refers, having recently used it in the preparation of an article of my own. In this important paper of Cannon, the author dwells on the effect of excessive emotion, as rage or fear or joy, on the autonomic nervous system. He explains the effect of such emotion on the vessels, heart and glands and other organs or parts which are under the influence of this system. Very extraordinary disturbances of this part of the nervous system can, of course, be brought about by fright. If we accept the James-Lange theory of emotion, impressions are made on that system before there is any expression of the emotion itself. The only point which does not appear to me as logical in Dr. Spiller's paper is that, in a case such as he has referred to, how can fright bring about the microbic condition which was evidently at the bottom of the abscess formation? There seems to be a link wanting in the etiologic chain. I am pretty well satisfied, however, that fright can do some dreadful things and not impossibly bring about organic changes in the nervous system.

DR. E. E. SOUTHARD, Boston: I should be inclined to deny, and I believe almost every member of the Section would also deny, that the emotion in Dr. Spiller's case was an important factor in producing the spinal-cord lesion. Of course, however, the literature of the *stigmatisées* of France may be quoted in rejoinder. Professor James was fond of quoting from more modern French writers certain cases in which posthypnotic suggestion determined favorably or unfavorably the course of suppuration. Again, I should say that Dr. Cannon's work on the zones in which the sympathetic system comes into contact with the cranial and the sacral, autonomic symptoms might have a bearing on a case like Dr. Spiller's.

DR. WILFRED HARRIS, London, Eng.: The author probably would include not only fright, but profound emotion of

other kinds as well. We have all seen nervous diseases of various kinds follow violent emotion. I have seen the first symptoms of locomotor ataxia develop the next day after violent emotion, and I have seen trigeminal neuralgia develop in a woman three-quarters of an hour after seeing her child killed in the street. Paralysis agitans, too, was noticed, especially frequent after the horrors of the siege of Paris. If we study the question we must give up the materialistic point of view that emotion has no relationship to the development of organic disease. In Dr. Spiller's case I should be less inclined to accept fright as the cause, but, as suggested by him, should be inclined to believe that ascending neuritis had much more to do with it, as the abscess must have been present for some time previous to the fright. In bicycling days it was not uncommon for perineal neuritis to develop as the result of saddle pressure. In one such case that I remember a man who had been riding on a bicycle for a number of hours developed ascending neuritis and myelitis and died. These cases of ascending neuritis are, I think, extremely rare, and Orr and Rows' work must be looked on very critically before it is accepted as evidence of ascending sepsis. Of course, we know that in tetanus there is an ascending poisoning of the motor roots, but it is stopped by the posterior root ganglia. Then we have, as a safeguard against ascending sepsis, the normal exudation of the cerebrospinal fluid outward along both anterior and posterior roots, and I think that it must be because of this safeguard that these diseases are not more common. Otherwise ascending myelitis would be much more common than it is at the present time, and it is an extremely rare disease.

Dr. Walter B. Swift, Boston: I have seen a case of multiple sclerosis, one of general paralysis and several others in which fright was said to be the cause of, and had in fact immediately preceded, the onset. From these and many other cases which have come under my observation, I have been led to believe that fright merely lowers resistance—the precipitating element. This inference may also be drawn from the work of Cannon. He has shown how fear and rage cause increase of secretion. With this the metabolic decrease of a resistive process might very naturally follow. If fright really caused paralysis agitans, in Paris they all would have had it. No, the disease was potentially there, the fright merely withdrew the resistance.

Dr. William G. Spiller, Philadelphia: Dr. Patrick asks whether I regard myelitis as rare. If by myelitis is meant only those conditions in which micro-organisms are found in the cord, it is very rare. If, on the other hand, those are included which show lymphocytic infiltration and congestion, as in poliomyelitis, I must say myelitis is not rare. It is common in syphilis. What shall be recognized as myelitis has been discussed over and over again. Where shall we make sharp distinctions? Lesions caused by occlusion of the blood-vessels are common with inflammation, as in syphilitic myelitis, and they are the common finding in cases of pressure on the cord, as in fracture of the vertebrae.

Harvey's Precepts for Lecturing.—Harvey laid down the following precepts for his own guidance as lecture precepts which the modern anatomical lecturer might observe with propriety: (1) to show as much as may be at a glance, the whole belly for instance, and afterward to subdivide the parts according to their position and relations; (2) to point out what is peculiar to the actual body being dissected; (3) to supply only by speech what cannot be shown on your own credit and authority; (4) to cut up as much as may be in the sight of the audience; (5) to enforce the right opinion by remarks down from far and near and to illustrate more by the structure of animals according to the Socratic rule; (6) not to praise or dispraise other anatomists, for all did well and there was some excuse even for those who are in error; (7) not to dispute with others; (8) to state things briefly and plainly; (9) not to speak of anything which can be explained without the body or can be read at home. Here we have a combination of orthodox medical ethics and sound pedagogy.—Dempster, "Pathfinders of Physiology."

OCCLUSION OF THE POSTERIOR INFERIOR CEREBELLAR ARTERY

REPORT OF CASES *

ANDREW C. GILLIS, A.M., M.D.

BALTIMORE

The posterior inferior cerebellar artery is usually described as the largest branch of the vertebral artery, and its course as passing obliquely backward around the medulla oblongata, at first between the roots of the hypoglossal nerve, then between the roots of the accessory and the vagus nerves, to end on the inferior surface of the cerebellum.

In a recent study Bury and Stopford[1] have shown that there is considerable variability in the course of the artery; that in many cases, instead of passing directly backward after its origin from the vertebral, it forms a distinct loop, the convexity of which is toward the pons. The ascending limb of the loop usually passes upward in the posteriolateral sulcus, and in this position supplies small terminal branches to the medulla oblongata. Occlusion of the posterior inferior cerebellar artery produces a definite clinical syndrome, in spite of the variability in the course of the artery, and in the number of branches it supplies to the medulla oblongata. Cases have been studied pathologically by Hun,[2] Thomas,[3] Wallenberg,[4] Spiller[5] and others, and their investigations have shown that the lesion in the medulla extends laterally from the restiform body to the inferior olive and vertically from where the restiform body passes into the cerebellum to about the middle of the hypoglossal nucleus. The structures usually involved are the descending root of the fifth nerve, the nucleus ambiguus, the glossopharyngeal and vagus nuclei and the ventral and dorsal spinocerebellar tracts (Wilson[6]).

The symptom complex produced by occlusion of the posterior inferior cerebellar artery is as follows: sudden onset with giddiness and marked tendency to fall to the affected side; no loss of consciousness; difficulty with swallowing and occasionally with phonation; loss of appreciation of pain, heat and cold over part or the whole of the trigeminal area on one side of the face (usually the side of the lesion) and a corresponding loss of pain and temperature sense over the opposite side of the body from the face down; touch, tactile discrimination, deep pressure and muscular sense are intact; paralysis of the sympathetic on the side of the lesion, causing retraction of the eyeball, contraction of the pupil and drooping of the eyelid; ataxia of the arm and leg, usually on the side of the lesion. In the course of from two to six months practically all symptoms disappear, other than the sensory changes, which usually are permanent. Although a comparatively rare condition, sufficient cases have been studied to show that the symptom complex varies very little, especially so when the initial symptoms have passed away.

During the past year, two cases have come under my observation, one of which I have had the privilege of studying from within a few days of the onset; the

---

* Read before the Section on Nervous and Mental Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Bury and Stopford: Med. Chronicle, Manchester, 1913, lviii, 200.
2. Hun: New York Med. Jour., 1897, lxv, 513.
3. Thomas, H. M., Maryland Med. Jour., 1907, l, 204.
4. Wallenberg: Arch. f. Psychiat., 1901, xxxiv, 923.
5. Spiller: Jour. Nerv. and Ment. Dis., 1908, xxxv, 365.
6. Wilson: Proc. Roy. Soc. of Med., Neurol. Sec., 1909, p. 52.

second case, an old one, I have observed especially in regard to the presence of permanent symptoms. Both patients are quite intelligent, and this has been of great value in the study of sensory changes.

CASE 1.—The patient is a married woman, aged 40, whom I saw in consultation with Drs. William T. Watson and A. W. Macdonald of Baltimore, Oct. 6, 1913. Her general health had been fairly good up to the present illness, with the exception that she had complained of pain in the back for several years. She gave the following history in regard to her present illness: Oct. 2, 1913, while attending to some household duty, she suddenly became giddy and found that on attempting to walk, there was a tendency to go to the right side. This did not bother her very much, and on the following day she was able to come from her home in the country to Baltimore, a distance of about 40 miles. That night, about midnight, thirty hours after the initial symptoms, she had a sudden sharp pain in the right forehead, lasting for about an hour. This pain was followed by a sense of numbness over the upper part of the right face. The following afternoon (October 4) about 4 o'clock, she had an attack of vomiting lasting for a few minutes. When I saw the patient, October 6, she presented the following condition:

The right eye was slightly retracted, the pupil small, and slight drooping of the eyelid. Both pupils reacted to light and distance. The right did not dilate as readily as the left when the skin of the neck was irritated. There was no nystagmus. Sight, hearing, taste and smell were normal. No weakness of the muscles of the face, pharynx or larynx was noticeable, nor was there any difficulty in swallowing, nor any disturbance of voice. There was a marked tendency to fall to the right side when the patient attempted to sit up in bed, and it was impossible for her to stand up on account of this condition. The patellar and Achilles reflexes were somewhat more marked on the right side than the left; the arm reflexes were equal on both sides; the plantar reflex was normal on both sides.

Fig. 1.—Areas affected in Case 1.

Fig. 2.—Areas affected in Case 2.

Sensory Disturbances: The patient complained of slight numbness over the right side of the face, and the left side of the body from the nipple line down; the right eye felt peculiar, the right nostril as if it were swollen. Touch, tested with cotton-wool, was perfect over the entire body. Tactile discrimination, tested by means of the compasses, showed no difference between one side of the body and the other. The conjunctiva and cornea of the right eye were insensitive to the touch of cotton-wool. The right nostril was not so sensitive as the left. Deep pressure sense was normal on both sides.

Muscular Sense: The patient could appreciate all movements either of arm or leg on either side of the body. Recognition of weight, size, shape and form was normal.

Pain Sense: There was absolute loss of cutaneous pain over the upper part of the right side of the face, comparing roughly with the distribution of the first and second branches of the trigeminus nerve. There was also total loss of pain sense over the left side of the body below the nipple line, or about from below the distribution of the fourth spinal root segment.

Temperature Sense: There was loss of appreciation of heat and cold over the same area as that of loss of pain.

There was no change in the patient's condition until about October 17. On that date it was found that a pin-prick produced a peculiar, disagreeable, tingling feeling over the affected area on the left leg up to about the knee. Stroking or scratching caused the same disagreeable feeling. The affected area on the face was somewhat less in extent, but there was no change in the character of sensation experienced there. There was still difficulty in standing erect.

October 25: Area of disagreeable feeling produced by stroking or pin-prick now felt up to the hip. No change over forehead. Patient is able to stand without assistance, but is still unable to walk.

October 31: Disagreeable feeling now felt over the entire affected area on the left side. Extremes of heat and cold can be recognized over the forehead.

November 28: No change in the sensory symptoms, with the exception that the disagreeable, tingling feeling was not so marked. The right pupil was about normal size, but there was still some drooping of the eyelid and retraction of the eyeball. The patient could walk fairly well, but was somewhat uncertain in going down stairs.

The patient went to her home, Nov. 30, 1913, and I did not have an opportunity to examine her again until June 18, 1914. At this time, examination showed practically no change in her condition. The sensory disturbances and the eye symptoms were the same as on Nov. 28, 1913. There was still a slight tendency to fall to the right side when the head was quickly turned, either to the right or left, and some slight unsteadiness in going down stairs.

From the increase in severity of the symptoms for a period of over forty-eight hours until the clinical syndrome was complete, one would usually consider this case to be one of thrombosis rather than embolism of the artery. No cause could be found for the supposed thrombosis. There was persistent high blood-pressure, ranging from 250 mm., October 4, to about 200 mm., Nov. 28, 1913, and on June 18, 1913, it was still found to be abnormally high—210 mm. There seemed to be no signs of arteriosclerosis unless the high blood-pressure could be counted as symptom. The urine was normal: a Wassermann test of the blood-serum was negative.

CASE 2.—The patient is an unmarried man, aged 39, who was referred to me by Dr. A. G. Rytina of Baltimore. One morning after breakfast, in August, 1913, this patient had a severe attack of giddiness, so severe that he could not stand and was forced to crawl back to bed. Even when sitting up in bed, there was a marked tendency to fall to the left side. He had severe vomiting; was unable to swallow anything for several hours, and for a week could swallow only liquids. His voice was weak and husky for several days. There was no interference with sight, hearing, smell or taste. When examined by a physician, it was found that there was total loss of pain and temperature sense over the left side of the face and over the entire right side of the body, the face alone excepted. At the time of the onset of his illness the patient was employed in St. Petersburg, Russia, as a skilled mechanist. He was thought to have lues, and was treated by a Russian physician with mercurial treatment for six weeks. At the end of that time, he was able to walk fairly well, and to travel to Aachen, Germany. Here he took the baths for six weeks longer, and then sailed for his home in Baltimore. Although he experienced no difficulty in walking on land, aboard ship he found, even when the ship was very steady, that he was insecure on his feet. In fact, he avoided going on deck because he was afraid he would be thought intoxicated, on account of his unsteady gait. A few weeks after arriving home, he attempted to work at his trade, but he found that he could not use his right hand so readily as formerly in doing any careful or exact work. In March, 1914, he again

took up his former employment and seems to be getting along all right. The patient states that he improved gradually for the first six months after the onset of his illness, but that there has been little, if any, improvement since then. He was given three doses of salvarsan during 1911 and 1912, and before that time had taken mixed treatment for several months, without any change in his condition. I have examined him several times since my first examination in November, 1913, and find no change in his condition, so the symptoms that are present are undoubtedly permanent. These are as follows: left eye slightly retracted, slight ptosis of left eyelid, loss of corneal and conjunctival reflexes; entire loss of appreciation of pain, heat and cold over the upper half of the left side of the face, and partial loss over the lower half. On the right side of the body up to about the nipple line, pin-prick produces a diffuse disagreeable sensation. The same sort of sensation is produced by stroking or scratching the skin. Heat is felt as gentle warmth over the entire right side of the body from the face down. Cold causes a disagreeable feeling over the same area. The skin of the left side of the face bleeds very readily when pricked with a pin. Touch, tactile discrimination, deep pressure and muscle sense are present over the entire body.

Both of these cases are fairly typical of the clinical result produced by occlusion of the posterior inferior cerebellar artery. There are a number of very interesting questions which arise in connection with an attempt to explain the various symptoms found in this condition. I shall not attempt to correlate each symptom with a corresponding anatomic or pathologic fact, especially as my reports are merely clinical ones, and I shall mention only the probable cause of the principal symptoms.

The sudden giddiness and instability in standing or sitting can be attributed to disturbance of Deiter's nucleus and the neighboring fibers (Wilson).

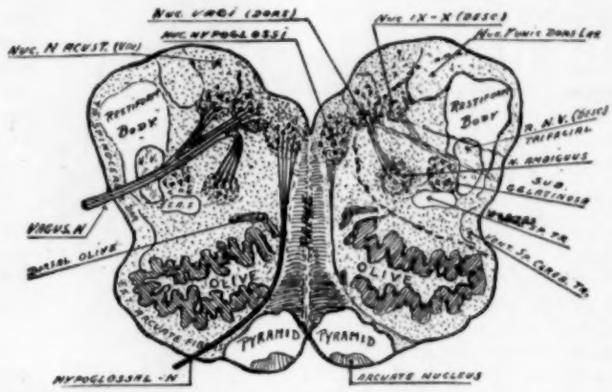

Fig. 3. Transverse section of medulla (after Edinger). Dotted line shows area usually involved in lesion.

The ataxia of the arm, or occasionally the hemiataxia, is probably due to interference with the dorsal spinocerebellar tract.

The loss of pain and temperature sense over the trigeminal area, usually on the side of the lesion, results from the destruction of the descending or sensory root of the fifth nerve. The presence of touch and pressure sensation in the disturbed area of the face can be explained as suggested by Woods,[7] by the probability that these sensations, after reaching the gasserian ganglion, enter the sensory root and go directly into the chief trigeminal nucleus, and thus escape in destruction of the descending root.

The involvement of only the first and second branches of the trigeminus, as in Case 1, has been attributed to the fact that the first branch of the nerve descends lowest in the medulla oblongata, the second branch next lowest, and the third branch highest (Müller,[8] Spiller[5]). A lesion involving the lower part of the medulla would implicate only the first and second branches of the nerve.

The loss of pain and temperature sensation on the side opposite the lesion is due to involvement of the fibers which carry sensation of pain, heat and cold, these fibers having crossed shortly after entrance to the posterior horns. The area of intact sensation between the face and the disturbed area on the body, as in Case 1, shows that only a part of these fibers are involved in this case. Somewhat similar cases have been reported by Mai,[9] Kutner and Kramer,[10] and Harris.[11]

The retraction of the eyeball, drooping of the lid and contraction of the pupil usually on the side of the lesion, show that the sympathetic fibers entering the lower part of the cervical cord do not cross over until they reach the upper part of the medulla.

The symptom complex produced by occlusion of the posterior inferior cerebellar artery is so definite and usually varies so little that it should be readily recognized. The sudden onset, without loss of consciousness, the tendency to fall to one side, the loss of pain and temperature sense, without involvement of touch and other forms of sensation, affecting one side of the face and the opposite side of the body, are very striking symptoms, and are sufficient on which to base a definite diagnosis.

914 North Charles Street.

ABSTRACT OF DISCUSSION

Dr. William G. Spiller, Philadelphia: Cases of occlusion of the posterior inferior cerebellar artery are not uncommon. I have seen a number of them clinically and have reported two with necropsy. They have a distinct symptom-complex and are easily recognizable by one familiar with the condition. Dr. Gillis referred to the fact that in his two cases the conjunctival reflex was lost although the tactile sensation of the face was preserved. Some years ago I called attention to the fact that loss of the conjunctival reflex occurs with loss of pain-sense in the face, not with loss of tactile sense. The cases of occlusion of the posterior inferior cerebellar artery afford proof of the correctness of the statement that the afferent path for the conjunctival reflex is over pain fibers. In this connection I again call attention to a symptom-complex I reported a number of years ago which seems to have attracted very little attention. In occlusion of the upper part of the anterior spinal and vertebral arteries we get a symptom-complex the complement of that shown in occlusion of the posterior inferior cerebellar artery. The former arteries supply the anterior pyramids and the lemniscus, and as a result of occlusion of these vessels we have preservation of the functions lost by occlusion of the posterior inferior cerebellar artery. We have also paralysis or paresis of all four limbs, coming on rapidly, a loss of deep sensation, of the sense of position, of passive movement and of bone sensation, and impairment of tactile sense with some impairment of the hypoglossal nerves.

Dr. Ernest M. Hammes, St. Paul: Was there any history of periodic headache in either of Dr. Gillis' two cases? In a case that Dr. Riggs and I reported before this Section last year there was a previous history of headache of an occipital nature, and I think both Oppenheim and Wallenberg reported similar conditions in their cases. Our case was of interest

7. Woods: Jour. Nerv. and Ment. Dis., 1913, xl, 91.
8. Müller: Deutsch. Ztschr. f. Nervenh., 1906, xxxi, 452.
9. Mai: Arch. f. Psychiat., 1904, xxxviii, 182.
10. Kutner and Kramer: Arch. f. Psychiat., 1907, xlii, 1002.
11. Harris: Proc. Roy. Soc. Med., Neurol. Sec., 1910, iii, 81.

because after the thrombosis of the posterior inferior cerebellar artery, the headaches disappeared entirely and have not returned in a period of two years. Another condition of interest in our case was the presence of a persistent glycosuria. I think Wallenberg reported two cases in patients with glycosuria. In our case sugar was present in from 2 to 8 per cent., and has persisted. So far as the history shows, the date of its initial appearance corresponded somewhat to the time of onset of the occlusion, and I have often wondered whether in this case there might not have been some analogy in the distribution of the posterior inferior cerebellar artery, and that an occlusion caused irritation of the floor of the fourth ventricle.

DR. WILFRED HARRIS, London, Eng.: I have seen many of these cases clinically but have followed only one to necropsy. The best description I have yet seen of that condition was presented by Dr. Spiller. I think Dr. Gillis did well to bring forward this condition because those not familiar with its clinical symptoms and pathologic findings are likely to be completely lost when they first meet such a case. A short time ago I saw a case of this kind with a very good doctor indeed, but he had not the least idea what he had in front of him. An old man of 80 was suddenly taken with giddiness and was totally unable to walk. When I saw him and attempted to make him walk he had crossed hemianalgesia and a crab-like gait. This is very suggestive of posterior inferior cerebellar thrombosis. The anesthesia varies according to the amount of damage. Sometimes there is no analgesia on the opposite side from the lesion. One symptom which I have seen in a case of this kind I have not seen elsewhere described. The case was that of a man past 70 who was taken suddenly with the first symptom as he expressed it, as though thousands of needles had been thrown against the side of his face. About twelve months after this, when able to walk again with some comfort, he said that he began to experience pain in the face, and the case was sent to me as one of trigeminal neuralgia. The pain was paroxysmal and shooting, resembling tabetic pains, and I think might be accounted for as due to sclerosis of the spinal root of the fifth nerve. On investigating the case I found it was not one to attack with injection, as there was complete analgesia of the left fifth nerve, but the pain was so agonizing something had to be done, and I was urged to attack it; therefore I did so against my judgment. The result was that his pain was even worse than before.

DR. A. C. GILLIS, Baltimore: With regard to headache, there was no history of it in either case, nor has there been any since the condition occurred. There was no glycosuria. I had those points in mind in investigating the cases, having read Dr. Hammes' report, and I could find absolutely no sign of glycosuria. I bring these cases before the Section not because they are fairly rare, but to emphasize more particularly the clinical syndrome described by Dr. Spiller, which I followed largely, in order to bring it to the attention of the general practitioner. I believe that it can be as readily recognized by the ordinary practitioner as by the neurologist.

Man's Redemption of Man.—The human heart by which we live has been touched as with the wand of a Prospero. What availed the scepter race! What the glory that was Greece, or the grandeur that was Rome! Of what avail even has been the message of the gospel, while the people at large were haunted by fear and anxiety stricken by the pestilence of the darkness and the sickness of the noon-day? The new socialism of Science with its definite mission cares not a rap for the theories of Karl Marx, of Ferdinand Lassalle, or of Henry George; still less for the dreams of Plato or of Sir Thomas More—or at least only so far as they help to realize the well-being of the citizen. Nor is there need to fear that in weighing the world in our balance we may drain the sap of its life, so long as we materialize in the service of man those eternal principles on which life rests—moral fervour, liberty and justice.—William Osler.

A CASE OF MYASTHENIA GRAVIS *

CHARLES A. McKENDREE, M.D.
CROMWELL, CONN.

The case of myasthenia gravis which I am about to report will not contribute anything new to the etiology or pathology of the disease, but from the standpoint of unusual development and duration it seems to me worthy of description. Incidentally, the clinical features may serve to provoke discussion of the neurogenic, myogenic or combined lesions often considered responsible for the syndrome presented. The time alotted me will not allow elaboration of the many theories of causation and of the widely divergent postmortem findings obtained by most careful investigators. Suffice it to say that as yet, as far as I have been able to learn, no definitely accepted pathology has been determined.

I am indebted to my chief, Dr. Frank K. Hallock, for permission to report the following observations:

History.—Mrs. X., aged 48, was the fifth of nine children. The father died at 75 of nephritis, but had always been strong. The mother died at 52 of a "brain-fever," so called, and was of a decidedly nervous temperament. Of the brothers and sisters there are three now living and well. Of the five who died, two died from the effects of appendectomies, one of gunshot wound, one at birth, and one of septicemia. One of the sisters for years previous to the surgical operation which caused her death suffered from trophic disturbances of the cornea and the skin, which were never diagnosed. As a child the patient was considered exceptionally strong and at an early age took on herself many household responsibilities. Patient was married at 28. The first child was born in the second year of her marriage. She had a difficult, thirty-six-hour labor, with retained placenta and moderate fever. This necessitated bed treatment of four weeks.

Eight months after the birth of this child the patient, on arising one morning, discovered that her eyes did not move together and that motion was limited. As far as she could determine the left eye seemed the more affected. Diplopia suddenly became marked.

She was seen at once by an oculist, who noted beside the muscular defect of which the patient complained a slight ptosis of the left eye. She endured this very disagreeable condition for many years, during which time she had three normal children and no miscarriages. She maintained her position as the head of a large household, with many social responsibilities, and took an active part in the upbringing of her children. Six years ago, in spite of the eye-strain involved, she took up the study of art and drawing and became utterly exhausted. This collapse required absolute quiet and rest. Shortly afterward an eminent oculist made an exhaustive study of her ocular condition and concluded that the limitation of movement together with the diplopia were due to a central lesion following childbirth.

Four years ago the patient fell down a flight of stairs and struck the right side of her head with considerable force. Since this accident she has been unable to move the right eye as much as formerly, has had no endurance, and her daily life has been progressively more circumscribed.

She passed through the menopause at 46 with no particularly disagreeable vasomotor disturbances.

About eighteen months ago she noticed for the first time that her speech became peculiar at the end of some length of time in reading aloud or in conversation. This feature has persisted, off and on, with varying intensity.

During the past twelve months she has observed a fatigue of her muscles of mastication, especially of the tongue, while taking her meals. At times the sensation has been so overpowering that she has been forced to rest the bolus in her

---

* Read before the Section on Nervous and Mental Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

cheek until she could swallow it after sufficient rest. On a few occasions liquids have passed into the upper nasopharynx and posterior nares.

Walking has become more and more difficult, and prolonged conversation exhausting.

Feeling concerned over a certain loss of interest in things, and a diminution of her keenness of concentration, she came under our observation in April of last year, for the purpose of learning how best to adjust herself to her home surroundings with her ocular limitations. At no time was the patient alarmed by her symptoms, but rather comforted herself with the explanation that her "lack of vitality was due to eye-strain."

The following is my record of physical and neurologic findings, April 23, 1913:

Examination.—Patient in recumbent posture presents moderate Basedow facies, although exophthalmos is very slight. Sallow complexion; mucous membranes show no noteworthy pallor; skin generally dry; tongue clean; appetite fair; digestion normal; bowels not constipated.

Pulse 80; regular in force and rhythm. Systolic pressure, left arm, recumbent, 112 mm. (Tycos). Lungs negative; noted peculiar formation of anterior chest resembling flattened pigeon-breast. Patient is unable to take deep inspirations, failing apparently to put lower intercostal muscles and diaphragm into normal play. Heart negative except for very faint hemic murmur at base. Sounds well defined. No hypertrophy.

Abdomen is negative except for moderate bilateral renal ptosis. Liver and spleen not palpable; no tenderness elicited except on deep palpation over kidneys.

Pelvic examination made at a later date negative except for moderate ligament relaxation.

Thyroid gland not enlarged.

Mental state is apparently normal; patient is intelligent; excellent witness; good memory; not easily depressed; essentially not neurotic in type.

Special Senses: Vision: Acuity not tested—refractive error corrected by glasses. Fields are normal to rough test. Fundi examined at a later date and found normal. Hearing is normal to watch-tick and to tuning-fork tests. Taste and smell are normal by actual tests for salt, acid, sweet, etc.

Cranial Nerves: Third, Fourth and Sixth: There is the smallest possible lateral movement of ocular muscles to right and left, no upward and very slight downward motion. Axes are parallel. Very moderate ptosis on the left, none on right. No strabismus; diplopia only in upward fields. No nystagmus. Normal reaction to Barany caloric tests within the range of the muscular limitation. Pupils are equal, regular, central and moderately dilated. The reaction to light accommodation and consensual tests is definitely present, but sluggish.

Fifth nerve is intact in motor and sensory tests.

Facial Nerve: Levator palpebrae superioris acts well and equally right and left. Orbicularis palpebrarum very weak, right and left to resistance, but patient closes eyes normally at will except when very tired, then action of the right is not complete. Slight right facial paresis noticed in weakness of frontalis, orbicularis palpebrarum and corrugator supercilii muscles.

Eleventh and Twelfth Nerves: Swallowing tests are normal; palate rises equally, right and left. Tongue protrudes in the middle line; no tremor and no wasting.

Speech during examination is normal, but has a certain nasal quality.

The motor system, including head and neck, upper and lower extremities and trunk is intact. Range and tone are normal. Power is somewhat diminished, but not more than one would expect in a patient who has been so restricted in activity. There is no tremor, wasting or ataxia in upper or lower extremities.

The sensory system is intact for cotton-wool, pin-prick, deep pain, position, vibration and astereognosis tests.

Reflexes: Palatal, present right and left. Jaw-jerk normal. Supinator, bicipital and tricipital present and equal, right and left. Epigastric and abdominal, absent right and left. Knee- and ankle-jerks increased equally right and left. No clonus. Plantar negative to Gordon, Oppenheim and Babinski tests. There is noted a *mouvement d'eventail* and marked flexion of the right toes; and on the left a slight flexion of the toes only. On both sides the great toe remains stationary on plantar stimulation.

Gait normal. Rombergism absent.

Sphincters normal.

Urine Examination, April 28: Daily quantity, 52 ounces; specific gravity, 1.010; acid; albumin and sugar absent.

Blood Examination, October 7: Red cells, 5,560,000; leukocytes, 8,656; polymorphonuclears, 63.5 per cent; transitionals, 1 per cent.; small lymphocytes, 30.2 per cent; large lymphocytes, 3.8 per cent.; eosinophils, 0.5 per cent. basophils, 1 per cent.; platelets normal; 500 cells counted.

Progress under Observation.—The foregoing points covering dysphagia and dysarthria were not complained of during the first interviews because the patient did not consider them of any importance. At first she complained only of general fatigue and wished instructions of how best to manage her physical and nervous force. Placed on a routine of two or three short walks daily, together with massage and passive movements, the patient soon presented a picture of fatigue of a peculiar order. A ten-minute walk was often followed by profound sleep, varying from one to two hours in length. She complained of indefinite aching throughout the body, but particularly of the trunk. Massage produced great fatigue. Within a few days difficulty in chewing her food was noted—a fatigue of jaws and tongue which passed away with a few moments' rest—with a return in as many moments. Soon the patient was tested for reading aloud. At first the words were clearly enunciated, but at the end of three minutes, the voice became noticeably husky and steadily more and more indistinct. At the end of five minutes the dysarthria became painful, accompanied by an overwhelming sense of oppression in the chest and a general exhaustion. On one occasion the patient was forced to go on to an almost complete mumbling of words and then commanded to clear the throat two or three times and continue. The surprising fact was noted that without more than momentary rest, such as was required in clearing the throat, the words gradually became more distinct until the reading was quite intelligible. Absolute exhaustion followed this forced test and the patient was unable to take her dinner or to sleep during that night. Consequently, in later observations, this test was not repeated, although dysarthria in ordinary conversation was constantly noted.

The patient often required support for her head and neck while in a sitting position because of great weakness.

During the latter part of May the myasthenic reaction was sought in the face, neck, shoulder-girdle and forearm muscles without positive results. Brisk faradism brought forth a sharp, apparently normal wave of contraction to repeated shocks continued for several minutes. At a later date, however, it was definitely shown that continuous mechanical irritation of the deep reflexes produced a diminution of reaction. June 10, the patient went to her summer home, where her physical and mental activities were restricted. Easy fatigue was constantly noted. During the summer she gained 5 pounds in weight.

She returned for further observation October 2. The rest of our experience with her was devoted to experimental therapy. Placed on carefully regulated thyroid medication she speedily developed untoward symptoms such as rapid loss of weight, increased pulse, moderate hyperpyrexia and malaise. Thyroid was discontinued after five days. It may be interesting to note here that although the patient manifested at no time neurotic tendencies, bromid in 10-grain doses seemed to afford the greatest relief. Strychnin and hypophosphites long continued were apparently of no service. A second blood examination including a differential count was entirely negative. No Wassermann was taken because patient's knowledge of medical procedures seemed contra-indication. Under absolute rest and restricted use of voice and eyes, local manifestations of easy fatigue continued to show in various tests. Diagnosis of myasthenia gravis was made in November. Dr. Frederick Tilney of Brooklyn in consultation confirmed the

diagnosis. Because of a change of residence, the patient then passed out of my direct observation.

The history since then has been one of variable states; at times the patient has been overwhelmed with sensations of "sinking" exhaustion, sometimes immediately followed by comfortable days. There have been no attacks of dyspnea, although as remarked above, the intercostal muscles and diaphragm were apparently affected. As far as I have been able to learn there has been no profound change in the condition in the past six months.

In conclusion I would call attention to four facts which I consider worthy of reiteration:

1. The disease is now of nineteen years' duration, and the patient is not at present in an alarming state. I believe that in point of time it is the longest case reported.
2. There was sixteen years' interval between the appearance of the first objective sign, that is, ocular paresis and ptosis, and the throat and jaw symptoms.
3. During these sixteen years the patient suffered only from what she considered a low state of vitality induced by eye-strain; managed her household and had three normal labors.
4. Passive manipulation of the general muscle-groups produced at times great exhaustion.

ABSTRACT OF DISCUSSION

DR. GEORGE A. MOLEEN, Denver: Myasthenia gravis has been a subject of particular interest to me inasmuch as one of my early cases was distinctly one, I think, of myasthenia gravis from the clinical point of view. It was reported, however, by me, owing to the findings later, as one resembling Addison's disease. It began twenty-four years prior to the time I saw it, with muscular weakness, ease of fatigue, dysphasia, and some ocular symptoms which I do not recall now. There were remissions from time to time. The patient was examined at that time by Dr. Church of Chicago, who thought that it was then a progressive muscular atrophy. Some six years later he again had opportunity of seeing the case, when he concluded that it was one of myasthenia gravis. The attack was in its height when I first observed the case in Denver in one of the summer months. A considerable dysentery was the reason for my being called. When we find a patient in Colorado with a blanket over his shoulders, suffering with dysentery and unable to move because of extreme weakness our first impression is—tuberculosis. My question as to how long the lung condition had existed was met with the prompt response, "I have no lung trouble, it is muscular weakness." I found that this was true. There was profound fatigue, dysphasia and dysarthria; the reflexes were normal, but rapidly enfeebled by examination. In short, the examination as carried out revealed a tenderness in the right hypochondrium, and catheterization of the ureters also showed that the pus that was in the urine came solely from the right kidney. An operation was advised, and a large perinephritic abscess was opened, the poles of which could not be reached, but it was fair to presume that the upper pole of this abscess compressed the adrenal between the abscess cavity and the liver. Evacuation of the abscess was followed by prompt relief. In the course of four or five days after leaving the hospital the patient walked from his residence some eleven or twelve squares and returned, progressing from that time on, and is conducting a business in one of the middle states at present. This case would suggest the relation of the internal secretions at least. Further than this I have nothing to say. I was struck by the statement that thyroid had been used and aggravated the symptoms. It might be pertinent then to suggest that the adrenal substance might be used in this case. I have been very frequently reminded of my experience in this one case, which was unique, and which is, I think, at least worthy of mention in association with Dr. Karpas' case.

THE NECESSITY FOR RESTRICTION AND CONTROL OF SEWAGE POLLUTION OF THE GREAT LAKES SYSTEM *

ALLAN J. McLAUGHLIN, M.D.
Chief Sanitary Expert and Director of Field Work for the International Joint Commission
WASHINGTON, D. C.

The success of any sanitary improvement depends on public opinion, and before we achieve any decided improvement in the condition of our sewage-polluted sources of water-supply there must exist a healthy sentiment in favor of such improvement. There has been considerable popular clamor in favor of "prevention" of pollution, but by demanding the impossible these well-intentioned enthusiasts did more harm than good.

Absolute prevention of pollution of waterways on an inhabited watershed is impossible. Speaking generally, water-supplies taken from streams and lakes which receive the drainage of agricultural and grazing lands, rural communities and unsewered towns are unsafe for use without purification, but are safe for use if purified.

If pollution on uninhabited watersheds is inevitable and water taken from such sources must be purified, why, asks the practical city engineer, may we not utilize the streams for sewage disposal and avoid expensive methods of sewage treatment?

In waterways where some pollution is inevitable and where the ratio of the volume of water to the volume of sewage is so large that no local nuisance can result, the method of sewage disposal by dilution represents a natural resource, and the utilization of this resource is justifiable for economic reasons, provided that an unreasonable burden or responsibility is not placed on any water purification plant and that no menace to the public health is occasioned thereby.

Thus the whole question of how much or how little sewage treatment is necessary in an equitable adjustment between sewage treatment and water purification hinges on "what constitutes an unreasonable burden to impose on a water purification plant."

In order to estimate what constitutes an unreasonable burden or responsibility for a water purification plant we must first have a clear idea of the ultimate result expected of the plant, namely, a safe drinking water.

WHAT IS SAFE DRINKING WATER?

To be absolutely safe in answering the above query we would say that a safe drinking water must be a sterile water. However desirable this ideal may be it is not practicable in the public supplies of large cities. We must accept a slight occasional pollution as inevitable. Instead of attempting to find the germs of typhoid fever, Asiatic cholera and dysentery in water, we accept the presence of the *Bacillus coli* as an index of pollution with sewage, for the reason that the chances of finding the *B. coli* are very much better than the chances of finding the specific germs in the small quantity of water examined.

When we consider the grossly polluted water-supplies used by many of our large cities until recent years, we must admit that even if the present effluents from filter plants do not show constant absence of

* From the United States Public Health Service.

B. coli, they must be classed as reasonably safe, or relatively safe water.

In order to secure statistics from some of our largest filtration and purification plants a circular letter was sent out to about forty cities.

About fifteen responded, and in most instances the statistics covered at least one year. The list included mechanical, or rapid sand filtration, slow sand filtration, precipitation and disinfection, and disinfection alone.

TABLE 1.—SHOWING AVERAGE NUMBER OF BACILLUS COLI PER HUNDRED C.C. IN BOTH RAW WATER AND FILTERED OR TREATED WATER OF CERTAIN CITIES

City	No. of Samples	Type of Filtration	Average Number of B. coli per Hundred C.C.	
			Raw Water	Filtered or Treated Water
Toledo, Ohio	342	Mechanical	804	0.02
Minneapolis, Minn..	418	Mechanical	75	0.1
Grand Rapids, Mich.	365	Mechanical	92	0.3
Cincinnati, Ohio ..	240	Mechanical	1,175	1.4
Birmingham, Ala. ..	205	Mechanical	196	1.0
	174	Mechanical	400	0.2
Binghamton, N. Y..	420	Mechanical	59	1.2
Columbus, O.	365	Mechanical	606	1.3
Washington, D. C..	348	Slow sand	2,501	1.4
Providence, R. I...	600	Slow sand	732	4.3
Reading, Pa.	138	Slow sand	68	5.8
Baltimore, Md. ...	306	Alum and calcium hypochlorite	1,349	2.5
Richmond, Va.	237	Alum and calcium hypochlorite	460	8.0

Following a sanitary survey of the cities and towns in the basin of the Great Lakes, I recommended, among other things necessary, that a standard for filtered or treated water be established which should be a minimum requirement for the prevention of the spread of water-borne disease in interstate traffic, and that a standard of not more than 2 *B. coli* per 100 c.c. of water, taking the average of many samples by the Phelps' method,[1] should be adopted.

The surgeon general of the United States Public-Health Service in 1913 appointed a commission, consisting of the most eminent experts in the United States, to fix a standard for water-supplies used by common carriers in interstate commerce. This commission recommended four negatives out of every five tests of 10 c.c. each or the equivalent of 2 *B. coli* per 100 c.c. reckoned by Phelps' method. This standard was to be a minimum to prevent the spread of water-borne disease in interstate traffic and was purposely lenient because of the difficulty of enforcing a more rigid standard over the wide area from which common carriers in interstate commerce must secure their water-supplies.

Allowing a sufficient margin of safety, filter plants with a good raw water should produce effluents of less than 2 *B. coli* per 100 c.c. and it is my opinion that a modern water purification plant which delivers an effluent which has more than 2 *B. coli* per 100 c.c. is either inefficiently operated or is dealing with a raw water which imposes an unreasonable burden on the plant. Accepting tentatively the standard of less than 2 *B. coli* per 100 c.c. as a good drinking water, although perhaps not an ideal or a safe drinking water at all times, the results indicate that this standard is attained by both rapid and slow sand plants, even with a very bad raw water. Cincinnati and Washington, D. C., are good examples of each type.

1. Phelps, Earle B.: A Method for Calculating the Number of *B. coli* from the Results of Dilution Tests, Reports and Papers of the American Public Health Association, 1907, xxxiii, Part 2, pp. 9-13.

TABLE 2.—SHOWING BY MONTHS THE AVERAGE NUMBER OF B. COLI PER HUNDRED C.C. IN BOTH RAW AND FILTERED WATER IN WASHINGTON, D. C.

Month	Number of Days' Samples	Average Number B. coli per 100 c.c.	
		Raw Water	Filtered Water
1913			
January	25	4,582	7.4
February	23	502	1.0
March	25	2,871	0.5
April	26	20,910	4.1
May	26	661	0
June	25	910	0
July	26	5	0
August	24	88	0
September	25	412	0.5
October	27	622	4.7
November	23	1,167	0.5
December	25	538	0.5
1914			
January	25	640	0
February	23	211	0.5
January, 1913, to February, 1914.	348	2,501	1.4

Washington, D. C., has a slow sand filtration plant. There is a large reservoir capacity, and some alum is used in times of high turbidity. No hypochlorite or chlorin is used at any time. The general average for the Washington plant for 348 samples shows 1.4 *B. coli* per 100 c.c., which must be classed as a very good effluent. A close study of the results for individual months shows that there is a great fluctuation in the character of the raw water. There was a bad raw water in January, 1913, and April, 1913, and the results show that this unusual burden was probably too much for the purifying capacity of the plant.

TABLE 3.—SHOWING BY MONTHS, AVERAGE NUMBER OF BACILLUS COLI PER HUNDRED C.C. IN BOTH RAW AND TREATED WATER IN CINCINNATI

Month	Number of Days' Samples	Average Number B. coli per 100 c.c.		
		Raw Water	Filtered Water	
			Without "Hypo"	With "Hypo"
1913				
September	28	964	2.1	...
October	31	358	1.5	...
November	30	1,990	2.7	...
December	31	1,841	3.0	...
1914				
January	31	1,232	9.1	0.6
February	28	1,260	3.5	1.2
March	31	825	2.4	0.05
April	30	933	20.0	0.4
September, 1913, to April, 1914	240	1,175	5.6	1.4

The Cincinnati plant utilizes plain sedimentation followed by coagulation and mechanical filtration. Sulphate of iron and caustic lime are used, the latter to assist the action of the iron sulphate and not for softening purposes. Calcium hypochlorite is added to the filtered water for about five months in the year. Hypochlorite is used during January, February, March, April and May, which covers the period of muddy water and high bacterial counts.

An efficiency of 98 per cent. with a raw water containing 500 *B. coli* per 100 c.c. would give an effluent containing 10 *B. coli* per 100 c.c. This could not be considered safe water, especially if this were an average for a considerable period, because, of necessity, the maximum and other days included in the period would show greater pollution than 10 *B. coli* per 100 c.c. Ninety-nine and one-half per cent. efficiency with 500 *B. coli* per 100 c.c. in the raw water would leave 2.5 *B. coli* per 100 c.c. in the effluent. Thus, even with the highest limit of filter efficiency which may be expected in practice, raw water with 500 *B. coli* would not reduce the limit of what may be considered a reasonably safe effluent.

Degree of Pollution in the Raw Water	Percentage of Bacteria Removed by Plant	Result
500 B. coli per 100 c.c.	98	10 B. coli per 100 c.c.
500 B. coli per 100 c.c.	99	5 B. coli per 100 c.c.
500 B. coli per 100 c.c.	99.5	2.5 B. coli per 100 c.c.
200 B. coli per 100 c.c.	98	4 B. coli per 100 c.c.
200 B. coli per 100 c.c.	99	2 B. coli per 100 c.c.
100 B. coli per 100 c.c.	98	2 B. coli per 100 c.c.

A close study of water-supply statistics will show that if the raw water exceeds 500 *B. coli* per 100 c.c. the filter plant is likely to be overtaxed and produce an effluent with an average of more than 2 *B. coli* per 100 c.c., unless extraordinary assistance is given the plant in the way of large storage, preliminary filters and especially the liberal use of chlorin or hypochlorite. When the raw water averages less than 200 *B. coli* per 100 c.c. the plants seem able to reduce this count to less than 2 *B. coli* per 100 c.c. without extraordinary assistance.

The raw water should be of such character that after reasonable purification (not demanding extraordinary efficiency every hour of every day in the year) the effluent would show a satisfactory average.

Reasonable purification of drinking water is the degree of efficiency which may be expected of standard types of filtration plants, properly designed and constructed and efficiently operated. This may be rated as the removal of from 98 per cent. to 99.5 per cent. of the bacteria. This reasonable purification is not construed to include chlorination. In my opinion, raw water should be of such a character that a standard type of filtration plant properly designed, constructed and operated, could consistently produce therefrom a reasonably safe effluent without recourse to chlorination. I am further of the opinion that chlorination should be reserved to increase the necessary margin of safety in handling polluted water, to cope with fluctuations in the character of the raw water and to protect against accidents to the plant or interruptions in its ordinary efficiency.

The question becomes one of the size of the margin of safety. With water of 500 or more *B. coli* per 100 c.c. there is practically no margin of safety. With raw water of 100 *B. coli* or less per 100 c.c., there is an ample margin of safety, and by the use of chlorination an ideal drinking water with almost entire absence of *B. coli* may be expected. A standard of 500 *B. coli* per 100 c.c. for raw water would necessitate the use of chlorination or some other extraordinary assistance to filtration processes in order to secure an effluent of less than 2 *B. coli* per 100 c.c.

It is clear that the standard of 500 *B. coli* should only be considered as a maximum and not as an average. The exact limit of safety in raw water probably falls between the maximum of 500 *B. coli* and 100 *B. coli* per 100 c.c., but it is difficult to fix.

There is a strong tendency in America to accept any raw water, however bad, as a source of supply for a municipal filtration plant. This often imposes an unreasonable burden and responsibility on the water purification plant. Now, filter plants are not infallible. They are mechanisms which must be properly constructed and efficiently operated under careful bacteriologic control in order to secure a safe effluent. They are operated by human agency and subject to the results of human error. It is true that properly constructed and efficiently operated filter plants can produce safe water from a bad raw water, especially by the use of hypochlorite or liquid chlorin as an adjuvant. The responsibility of effecting such purification every hour of every day in the year is unreasonable and unfair. Many plants are now struggling with a raw water of such a character that a safe effluent is obtained only at the price of eternal vigilance, perfect operation every day in the year, and the free use of auxiliary chemicals. The raw water demanding such extraordinary treatment is like a sword of Damocles constantly threatening disaster. There is no margin of safety under such conditions.

I believe that a sufficient margin of safety should be given to all filter plants by reducing the pollution of the raw water to a point at which it would not impose an unreasonable burden or responsibility on the plant.

While prevention of all pollution is not feasible, control of pollution and its reduction in certain areas is imperatively necessary. In grossly polluted waterways used as sources of public-supply the reduction should be to a point somewhere between 500 and 100 *B. coli* per 100 c.c.

How far shall we go in providing a proper margin of safety? This depends largely on the cost.

The pollution, for example, of the Niagara and Detroit Rivers reaches to thousands of *B. coli* per 100 c.c. of water, as shown by the Progress Report of the International Joint Commission. The cost of the sewage treatment measures which would be necessary to reduce existing pollution to a standard of 500 *B. coli* per 100 c.c., would not be greatly increased if reduction to 100 *B. coli* were carried out. In other words, the cost of removing 75 per cent. of the *B. coli* in sewage is considerable, but the cost of removing an additional 15 per cent. or 20 per cent. would not be great. The removal of the additional 15 per cent. or 20 per cent. would be little more than the cost of the additional hypochlorite of lime necessary.

It is not deemed advisable to state definitely at this time what percentage of *B. coli* in the crude sewage of Detroit or Buffalo must be removed in order to bring the water in the lower river below 500 *B. coli* per 100 c.c. A study of the degree of pollution, however, will show that the reduction necessary will be at least 75 per cent. To provide a proper margin of safety the *B. coli* in the raw water should be reduced to a point somewhere between 500 and 100 per 100 c.c. Judging from the pollution found in the lower Detroit River this would correspond to an elimination of *B. coli* in Detroit sewage of from 75 per cent. to 95 per cent. As pointed out in a preceding paragraph the difference in cost between 75 per cent. removal of *B. coli* and the higher percentages up to 95 per cent. is relatively slight and well worth the expenditure in providing a proper margin of safety.

THE LATE MANIFESTATIONS OF INHERITED SYPHILIS

WITH ESPECIAL REFERENCE TO ARTERIAL DISEASE *

HENRY FARNUM STOLL, M.D.
Assistant Physician to the Hartford Hospital
HARTFORD, CONN.

Strictly speaking there is no inherited syphilis. Congenital syphilis better describes the condition, but even this does not convey the idea that the condition is in reality an acquired antenatal infection, the spirochetes being present in the placental blood. Many years of usage, however, have given these terms a permanent place in medical nomenclature.

It has long been known that syphilis is the most common cause of fetal death and that many of the children who do not succumb to its effects during the first few months carry its mark throughout life. But so vague and misleading are the symptoms of syphilis hereditaria tarda that except for the cases of interstitial keratitis, the diagnosis is one of the most uncommon in medicine. Yet the number of persons with an inherited infection perhaps equals those with acquired syphilis. The recognition of this condition is made more difficult by the frequent absence of the stigma we commonly associate with congenital syphilis. The key to the puzzle often lies in the family history. In addition to the points usually covered, inquiry should always be made as to the health of all living members. In no other class of patients does this part of the anamnesis attain such great importance. The history of paternal death from apoplexy or sudden heart-failure in early life means syphilis in the vast majority of cases, as does death from paresis, tabes or aneurysm, and in an obscure case we will do well to consider the possibility of congenital lues in our patient. Yet parental longevity is no guarantee against syphilis, as the grandmother of one of my patients was known to have been infected by her husband in middle life, and, though she subsequently gave birth to two imbecile children and had leg ulcers till the time of her death, she lived to be 93. I have recently obtained a strongly positive luetin test in a man of 91 who is recovering from a slight stroke of apoplexy. He had what was probably an urethral chancre fifty years ago.

Several times the first clue came from the statement that the mother had had several miscarriages and perhaps lost a number of infants in early life. In one instance it was ten years before it occurred to me that a frail little unmarried woman who was always ailing and seemed to have no resistance, might have had a congenital infection. She had a perfectly compensated mitral stenosis and aortic regurgitation, and gave a vague history of rheumatism when a child. Her mother had died suddenly at 46 and her father had also died young. Though there had been a large family, she was the only one living. Her luetin test was positive, one Wassermann weakly positive, and the improvement in her general condition after neosalvarsan and mercury was very gratifying. As she explained it she "felt like a real woman."

Fournier[1] states that congenital syphilis in a parent has the same effect on the fetus and infant that acquired syphilis has. He detected signs of active lues in 14 per cent. of the children of 116 families in which one parent had congenital syphilis. Of eighty-one pregnancies occurring in families in which one parent was an heredosyphilitic, death resulted before or soon after birth in 59 per cent.

As most of the statistics concerning congenital syphilis were made before the day of the Wassermann and luetin tests, it seemed desirable to apply them to a series of persons whose parents were either clinically syphilitic or had a positive Wassermann or luetin reaction.[2] Many of the cases belonged to the latter group and in a number of instances the parents were not conscious of ever having had lues. Tabes, paresis and aortic disease were considered as evidence of syphilis. A few observers have reported the results of the Wassermann test on whole families, but, so far as I know, the luetin test has not been used in conjunction with the Wassermann in any such series.

Luetin is the name given by Dr. Noguchi of the Rockefeller Institute to an emulsion of killed spirochetes prepared by him, which, when injected between the layers of the skin, produces a reaction in syphilis which is specific for the disease. Dr. Noguchi very kindly supplied the luetin for the tests.

In all, 68 persons—adults and children—were tested from 32 families. It so happened that no infants were included.

TABLE OF RESULTS OF TESTS IN THIRTY-TWO FAMILIES

	No. of Individuals	No. Wassermann Tests	Per Cent. Wassermann Positive	No. Luetin Tests	Per Cent. Luetin Positive
Irrespective of health	68	52	17	68	59
Apparently healthy (robust) ...	33	22	0	33	39
Those with obvious ailment*	35	30	43	35	77

* Either the Wassermann or luetin was positive in 31, 88 per cent.

It is seen from the accompanying table that 56 per cent., irrespective of their condition, had a positive luetin test and but 17 per cent. a positive Wassermann. Thirty-three appeared perfectly healthy and of this number 39 per cent. gave a positive luetin but in none was the Wassermann positive. The remaining thirty-five deviated more or less from our standards of health, but only a small minority would be classed with what we commonly think as congenital syphilis. For instance, the "Hutchinson triad" of deafness, interstitial keratitis and peg-shaped teeth, was uncommon, as were enlarged epitrochlear glands. Several had the "Olympic forehead" but the typical saddle-shaped nose was not seen. Anemia, malnutrition, extreme nervousness and disease of the aorta and its valves were the most common diagnoses. Very severe headache was the chief complaint in a number of instances, while others had vague pains, called "rheumatism." One patient, a man of 47, had an angioneural arthritis as described by Solis-Cohen,[3] another had Raynaud's disease. Of this group, 43 per cent. gave a positive Wassermann and 77 per cent. a positive luetin. In this latter group, however, there were four whose Wassermann reaction was strongly positive with a negative luetin test. If these be added to the twenty-seven in whom the luetin was positive, we find that 88 per cent. gave either a positive luetin or Wassermann reaction.

* Read before the Section on Practice of Medicine at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Fournier: Treatment and Prophylaxis of Syphilis, New York, Rebman Company, 1907.

2. Most of the Wassermanns were made at the laboratory of the State Board of Health under the direction of Professor Conn of Wesleyan University. I am indebted to Dr. Jessie W. Fisher for making a number of tests for me at the State Hospital for the Insane in Middletown, and to Dr. John A. Fordyce of New York for several tests made in his laboratory. A few were also made by Dr. H. C. Russ.

3. Solis-Cohen: Am. Jour. Med. Sc., 1914, cxlvii, 228.

Six children from three families in which one or both parents had inherited syphilis were studied. Three, or 50 per cent., had a positive luetin test. Two grown sons in good health did not react to either test. One rather frail boy had a negative luetin and a doubtful Wassermann. Of the other three, one, an exceedingly nervous girl of 16 who had chorioidal scars in one eye, gave a positive luetin and a doubtful Wassermann. Her sister with dactylitis had a positive luetin and a weakly positive Wassermann. They were both prema-

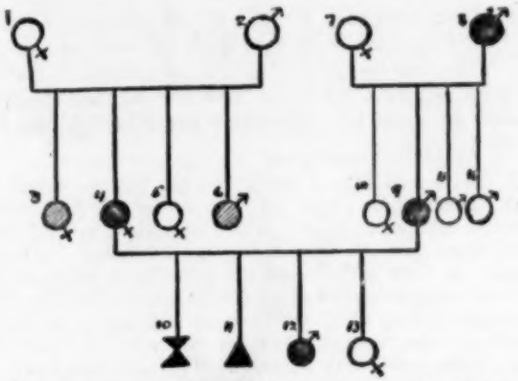

Chart 1.—Pedigree of family of Mr. X. In this and the following charts the circles indicate individuals, sex being shown by the regular signs (♂ for male, ♀ for female). Black circles represent persons known to have syphilis; shaded circles denote suspicious history or physical signs; black triangles indicate miscarriages, and double triangles stillbirths. 1 and 2. Living; not examined; said to be in good health. 3. Living, aged 42; malaria (?) as child; severe ulceration of throat; totally deaf. 4. Living, aged 40; very severe headaches all of life; Raynaud's disease; Wassermann —; luetin +. 5. Living, aged 38; many operations in girlhood for some "bone disease." 6. Living, aged 25; "Olympic head"; deafness about twentieth year; interstitial keratitis. 7. Died, aged 54; tumor of kidney. 8. Apoplexy at 42; paresis (?). 9. Living, aged 39; exceedingly nervous; laryngeal lesion improved by neosalvarsan and mercury; luetin +. 10. Stillbirth. 11. Miscarriage. 12. Living, aged 9; very frail; Wassermann ±; luetin +. 13. Living, aged 2; very prominent forehead; not tested. 14, 15 and 16. Not examined; said to be in good health.

ture babies, as were two others of that family. The third, a delicate boy with pyrexia, is of especial interest.

Tuberculosis had been diagnosed in this boy, aged 9, because of a more or less constant pyrexia which was associated with weakness and anorexia. When he first came under my observation he showed signs suggestive of enlarged bronchial glands, and I concurred in the diagnosis. The heart was free from murmurs but showed a slight sinus arhythmia. Shortly thereafter the father (Mr. X) came to me for an examination of his lungs because an eminent laryngologist in New York strongly suspected laryngeal tuberculosis. No evidence of any pulmonary lesion was found. As the patient, who was a man of intelligence, not only denied any venereal disease, but stated he had never had intercourse with any one save his wife, syphilis seemed out of the question. Moreover, laryngologically, it was not the picture of syphilis. He stated that his father had died of paralysis at 56, but further questioning elicited the fact that he had had his first stroke of apoplexy when he was 42. (One may assume that apoplexy before 50 usually means syphilis, between 50 and 60 frequently syphilis and after 60 possibly syphilis.) His father also developed delusions—accused his wife of infidelity, etc.—that were suggestive of paresis. I thereupon gave Mr. X the luetin test and a positive reaction resulted. Under neosalvarsan and mercury injections Mr. X's throat improved markedly. As his father possibly had paresis it is of interest that he has always been exceedingly nervous, once having to give up business because of nervous prostration. His little son gave a negative reaction to the intradermic tuberculin test, but reacted strongly to luetin.

Mr. X.'s wife gave the following interesting history. Her parents are living and said to be well. She was never strong as a child and has always been subject to severe headaches which were not relieved by glasses. Her teeth were very poor. About six years ago she began to have typical attacks of Raynaud's disease. Her first pregnancy resulted in a still-born child at term, the second one miscarried at the third month, the next, the delicate boy whose history has been given, and the fourth a girl not as yet tested, has an "Olympic" forehead. Her family history contains the following noteworthy points.

Her oldest sister became deaf in early womanhood and had a severe ulceration of the throat of unknown origin. As a child she had some indefinite sickness, accompanied by pyrexia, which was called "malaria." Another sister had a number of operations for bone-disease thought to be tuberculous. A brother, aged 25, who has very marked frontal eminences, became deaf in his late teens, and at about 20 it is stated that a "film" appeared over both eyes and though he was almost blind for a time, he recovered under treatment. Mrs. X gave a negative Wassermann reaction but a very positive luetin test. It would seem that both Mr. and Mrs. X were heredosyphilitics.

The next family resembles the preceding one in several particulars.

Mr. Z, a man of 36, who knew of no venereal infection, complained of "weak feelings," pressure in his head, and of great nervous exhaustion. He had "doctored for uric acid" a great deal. Ten years previous to being seen he had to stop work for nearly a year, because he could not think clearly and easily. He was very easily exhausted. Once he had a weak spell and had to be taken to a hotel. He was fearful his heart was weak. He occasionally had a catch in the left side, and, as he expressed it, was "easily wilted." Eighteen months previously he had to stop work for three months. He found his duties, which were those of office work, arduous because of difficulty in concentrating. When the weak spells came on, the left side of the body felt numb and he experienced a drawing sensation to the left side. For the previous four years much of the time he has had intense headaches which are worse at night. His head always felt bad on waking in the morning. He also suffered much from

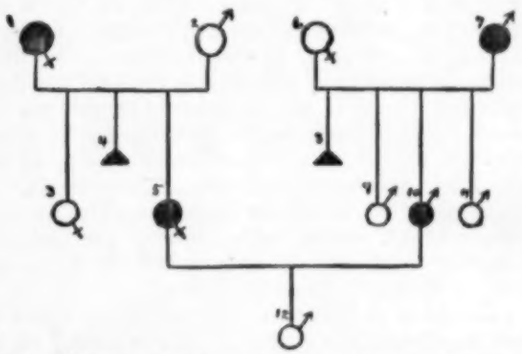

Chart 2.—Pedigree of family of Mr. Z. 1. Living, aged 64; hypertension; several slight strokes of apoplexy; luetin +. 2. Living, aged 70; angina pectoris; luetin —. 3. Living, aged 44; apparently well; Wassermann —; luetin —. 4. Living, aged 38; frail since girlhood; pulmonary tuberculosis; Wassermann —; luetin +. 6. Living, aged 70; good health. 7. Apoplexy at 68; had had tabes for several years. 8. Miscarriage. 9. Living, aged about 40; extremely nervous; not examined. 10. Living, aged 36; neurasthenia with severe headaches; Wassermann —; luetin +. 11. Living, aged 18; pleurisy; Wassermann —; luetin —. 12. Living, very robust, aged 14; Wassermann —; luetin —.

hot flashes. The man was well nourished and looked the picture of health. The physical examination was absolutely negative, and from a purely clinical point of view was a case of neurasthenia. In his family history, however, it was found that his father, who died at the age of 68, had had locomotor ataxia for a number of years, and before his death two strokes of apoplexy. An elder brother has been extremely nervous and, for that reason had to give up his

business. A younger brother had very severe headaches for a number of years in early life, occasionally so intense that he would fall to the ground. His mother had had two miscarriages. A number of Wassermann tests by two different laboratories were negative, but the luetin test was strongly positive before giving treatment and also at present. Following several injections of neosalvarsan and mercury he was completely relieved of all his symptoms. Unfortunately, the spinal fluid was not examined.

Mrs. Z has been very delicate since girlhood. Though ambitious, her strength fails her and she has always been a "weakling," but without obvious cause. Recently a very slight apical tuberculosis was discovered, but it hardly seemed enough to account for her marked loss of vitality. Nor did a course of tuberculin treatment benefit her. Two different serologists reported the Wassermann negative but

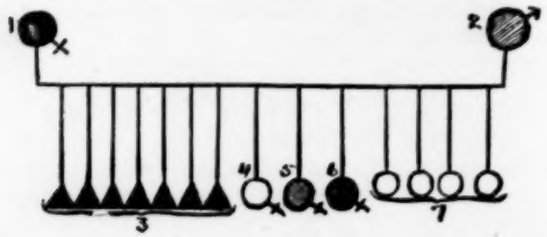

Chart 3.—Pedigree of family showing cardiac lesions. 1. Living, aged 65; aortitis; luetin +. 2. Husband died, aged 58; angina pectoris. 3. Severe miscarriages (sequence of pregnancies not known). 4. Died, aged 3 months. 5. Died, aged 30 +; decompensation following aortic regurgitation. 6. Living, aged 30; angina pectoris; aortitis (?); luetin +. 7. Not examined; one has precordial pain.

the luetin was very strong. Her father has had angina for several years and her mother, though apparently well, has hypertension and has had several strokes of apoplexy. Mrs. Z's mother gave a positive luetin test, but in her husband it was negative. Mr. and Mrs. Z have one boy aged 14 who is healthy and in whom both tests were negative.

One of the most common effects of congenital syphilis is its interference with the normal development of some particular part of the body. It may be mental or physical. It may involve one organ or a group of organs. There are cases on record of the complete transformation of a thoroughly incorrigible and vicious child by specific treatment. In addition to this, Fournier calls attention to what he very happily terms the "fragility of the system" as evinced by the proneness to diseases of all sorts, but especially tuberculosis. This is a very important group, of which Mrs. Z just referred to is an excellent example. "They frequently die," Fournier says, "at an early age 'of nothing at all,' so to speak, without any definite disease, and in many of such cases the most careful autopsy does not reveal the cause."

In some of my patients the dystrophies which Fournier mentions were evident. In one family of which the father had acquired syphilis before marriage, each of two daughters had a short arm and a son with interstitial keratitis stammered badly and had bilateral hernia.

In another family in which the father, a congenital syphilitic, had angioneural arthritis, a son was a cryptorchid and a daughter suffered from vasomotor disturbances of the hands and feet similar to those of her father.

Hubner was the first to direct universal attention to the study of the relationship of specific disease to the blood-vessels, and to-day it is generally appreciated that the majority of the clinical symptoms of syphilis are caused by changes in the arteries with their secondary consequences.

It has long been known that acquired syphilis attacks the aortic arch with great frequency, but very little has been written concerning the rôle played by congenital syphilis in this respect. Rebaudi[4] found changes in the aorta similar to those observed in acquired syphilis in thirteen out of seventeen still-born children. Roch and Weisner[5] found similar changes in 59 per cent. of their cases. In five cases Rebaudi demonstrated the spirochetes.

In several of my cases there was a lesion at the aortic valve.

In four instances I was able to prove the presence of latent syphilis in one or both parents by the luetin or Wassermann test. In several others the absence of any venereal infection and the sudden death of a parent in early life suggested the inherited nature of their infection.

A frail lad of 24 was brought to me because it was feared that tuberculosis might be the cause of his weakness, dyspnea and chest pains. The lungs were normal but the usual signs of aortic insufficiency were present. The venereal history in both patient and his father was negative but he gave a positive luetin test as did his mother and one of two younger sisters. The father gave a negative luetin but a weak positive resulted when the test was repeated. In all, the Wassermann was negative. The only suspicious thing in the history was the fact that his mother had had several miscarriages.

Biermann[6] has reported an interesting case of arteritis of the peripheral vessels associated with dilatation of the aortic arch in a young woman of 19 with congenital lues. The lesion of the aorta was diagnosed roentgenographically. In two of my cases of congenital aortitis the Roentgen ray showed no dilatation of the arch. In a third, presumably congenital, a well marked dilatation was revealed.

Clinicians the world over have observed families in which many of the members succumbed to heart or arterial disease. This is commonly attributed to the fact that they have inherited poor material for their arterial wall and that as a result of the vicissitudes of life the artery gives way. So far as I know, it has

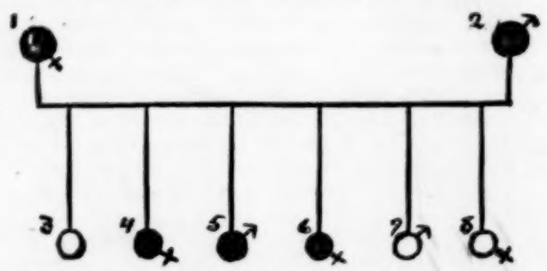

Chart 4.—Pedigree of family also showing cardiac lesions. 1. Mother living, aged 38; hypertension; Wassermann +; luetin ±. 2. Father died, "stroke," aged 35. 3. Died in infancy. 4. Living, aged 17; apparently well; Wassermann —; luetin +. 6. Living, aged 14; frail; aortitis; Wassermann +; luetin +. 6. Living, aged 8; internal strabismus; Wassermann +; luetin +. 7. Living, aged 6; frail; Wassermann ±; luetin —. 8. Living, aged 2½; apparently well; Wassermann not done; luetin —.

not been suggested that syphilis might be an important factor in these cases, yet several of the families studied suggest this possibility.

Attention has been drawn to the part played by syphilis in cardiac lesions, by Warthin[7] who concludes

4. Rebaudi: Monatschr. f. Geburtsh. u. Gynäk., 1912, xxxv, 681; abstr., The Journal A. M. A., Aug. 10, 1912, p. 490.
5. Roch and Weisner, quoted by Longcope, W. T.: Arch. Int. Med., January, 1913, p. 15.
6. Biermann, J.: Deutsch. med. Wchnschr., 1911, xxxvii, 1157.
7. Warthin: Am. Jour. Med. Sc., 1914, cxlvii, 667.

from his pathologic study "that syphilis, both congenital and acquired, is the most important etiologic factor in the production of cardiac disease, both myocardial and endocardial." From the clinical point of view, Schottmüller[8] reports a positive Wassermann reaction in over 40 per cent. of his cardiac cases taken as a whole, irrespective of the lesion.

A robust man of 35, who considered himself to be in perfect health, came to me as he had been refused life insurance because of heart-disease. He had a well-marked aortic regurgitation which had given no symptoms. He had had neither rheumatism nor venereal disease so far as he knew. Both the Wassermann and luetin tests were positive. His father had died of tetanus and his mother was living and in

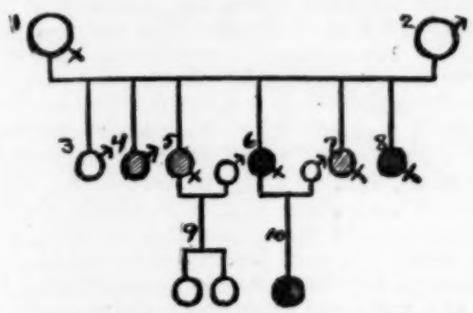

Chart 5.—Pedigree of family showing various disorders ascribable to syphilitic infections. 1. Died, aged 73; nephritis. 2. Died aged 50 +; nephritis. 3. Died in infancy. 4. Living, aged 50 +; hypertension. 5. Living, aged 50 +; hypertension; deafness in late teens. 6. Living, aged 48; neurasthenia; deafness in late teens; Wassermann —; luetin +; only daughter an epileptic (10), dying at 22. 7. Died, "withered kidney"; aged 28. 8. Living, aged 45; hypertension; neurasthenia; deafness in late teens; Wassermann ±; luetin +. 9. Apparently healthy twins.

good health. Inquiry, however, developed that his father had had a slight "stroke" in his fiftieth year. His mother gave a very strong luetin reaction.

The following family is of especial interest as one member had slight angina pectoris which, I believe, has not been ascribed to congenital syphilis.

A young woman, aged 27, whose husband had been in excellent health at the time of his death from an accident a few weeks after his marriage, consulted me in 1910, with a statement that she had been doctoring for the last six years for "rheumatism." This proved to be pain of a sudden character between the shoulder blades. Tuberculosis had been feared. The physical examination was practically negative, except for a very few râles over the right chest anteriorly at the border of the sternum, and a slight tenderness over the first sternochordal junction on the left side as well as over the midthoracic vertebrae. No definite diagnosis was made at that time. The patient seemed neurotic and not very ill. Eighteen months later she said "the rheumatism had been in the left shoulder and went through the heart." She complained of soreness through the upper left side of the chest and of a very slight cough. There were still a few râles in the secondary right space anteriorly near the sternum. (I was puzzled because the pain was on the left and the only abnormal sounds were on the opposite side.) About a year later she experienced some dyspnea in going upstairs and a soft systolic murmur was present in the second left interspace, but it was not accompanied by anemia. The upper outer border of the left trapezius muscle was found to be somewhat tender. Even at this time I did not appreciate what the condition was, as the murmur was present only in the second left space and I did not then know that an aortic systolic murmur may be heard only in the second or third left interspaces. On reviewing her family history I found, however, that her mother had had several miscarriages and that her father had had an enlarged heart and had died from angina pectoris at 58. The mother was apparently in good health, except for "rheumatism" through both shoulders and the upper part of the sternum. On examination it was found that she had a systolic murmur at the base of her heart. A sister had died from cardiac decompensation secondary to an aortic regurgitation. Both my patient and her mother gave a positive luetin test. The mother's "rheumatism" subsided after a course of inunctions, and the daughter's disappeared after neosalvarsan and mercury. Two other "heart families" were met with.

A man of 53, a policeman by occupation, complained of dyspnea on exertion. He knew of no venereal infection. His heart was enlarged and a systolic murmur was present which was loudest at the base. The systolic blood-pressure was 210; diastolic 110. His father had suddenly dropped dead in his forty-sixth year, and a brother had died from a "shock" when 48. Two Wassermanns were negative but the luetin test was strongly positive.

The perfect compatibility over a period of many years, of an occult lues and good health is here shown. This man had enjoyed excellent health for over fifty years, yet the disease which was to rob him of his rightful expectancy of life was slowly advancing but without sign or symptom. Had a Wassermann or luetin test been possible in his early life and thorough treatment instituted, he would be living to-day in all probability. The next family further demonstrates the importance of testing the children in all cases of sudden parental death in early life.

A boy aged 14, who is not anemic, has a well-marked systolic murmur over the base of his heart, loudest on the right and extending up to the clavicle. His father suddenly dropped dead when 35 years old. His mother, aged 38, has hypertension. The boy, his mother and one sister with internal strabismus, have very strong Wassermanns, and in a younger brother the test was doubtful. An older sister gave a negative Wassermann but a positive luetin.

It has long been recognized that syphilis may cause arterial hypertension, and because of the steady increase in the mortality from arterial and kidney diseases it is important to ascertain how important lues, and especially congenital lues, is in this condition.

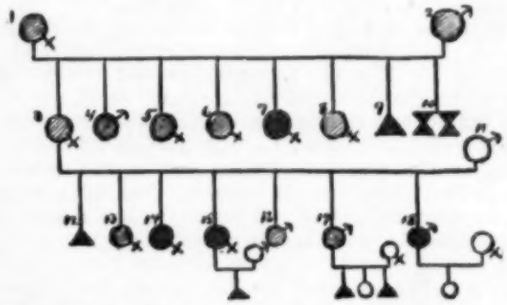

Chart 6.—Pedigree of family with cardiovascular disease in three generations. 1. Maternal grandmother died, aged 64; "apoplexy." 2. Her husband died of a "fatty heart," aged 64. 3. Died of acute dilatation of heart following pneumonia, aged 50. 4. Died, aged 17 "apoplexy." 5. Died, aged 38; "heart disease"; no rheumatism. 6. Living, aged 63; hypertension; several strokes of apoplexy; Wassermann —. 7. Living aged 60 +; apparently well; Wassermann —; luetin +. 8. Living, aged 58; was a 7-month baby; not examined; has much dyspnea. 9. Miscarriage. 10. Twins; stillborn seventh month. 11. Husband of No. 3; died of "tumor of throat." 12. Miscarriage. 13. Living, aged 45; hypertension; when a child had an ulcer of rectum very slow to heal; Wassermann —; luetin —. 14. Living, aged 43; hypertension (S. B. P. 270); Wassermann —; luetin +. 15. Living, aged 39; neurasthenia; Wassermann —; luetin +. 16. Died, aged 16; heart disease; no rheumatism. 17. Living, aged 37; not examined; has a chronic "sore" near anus. 18. Living, aged 36; apparently well; Wassermann —; luetin +. It is noteworthy that 60 per cent. of the pregnancies of the third generation resulted in miscarriages.

Hintzelmann,[9] whose original article I have not obtained, believes that congenital syphilis often causes

8. Schottmüller: Therap. d. Gegenw., 1913, xv, 337.

9. Hintzelmann: Ztschr. f. Kinderh., 1913, ix, No. 1.

chronic nephritis. Cassel[10] found renal changes in ten out of twelve syphilitic infants at necropsy and Murphy and Powers[11] state that the affection is, as a rule, a slow chronic nephritis, sometimes latent, sometimes showing acute periods.

Another interesting family is that shown in the following record:

The patient, an unmarried woman of good repute, aged 45, has suffered from extreme nervousness for a number of years and now has a systolic blood-pressure of 160. Her father died at about 58 of nephritis and the mother of the same malady at 73. One brother living has hypertension and an hypertrophied heart. Two sisters are married—both are extremely nervous. One had a child, an epileptic, who died at 22. The other sister has hypertension. A fourth sister died at 28 of a "withered kidney." All three living daughters became gradually deaf during their late teens. My patient had a doubtful Wassermann test and a very positive luetin. The sister, who was the mother of the epileptic child, gave a negative Wassermann but a positive luetin.

The next is the most remarkable family, as heart and arterial disease are present in three generations.

A little over a year ago I was called to attend an unmarried woman, aged 43, who was suffering from a greatly embarrassed heart-action and a systolic blood-pressure of about 270. She had lost a brother aged 16 from heart-disease, which was not secondary to rheumatism. Another brother, aged 37, is stated to have had some sort of ulcer at or near the rectum for several years, and periodically he "sheds" part of the skin from the soles of his feet. Two of his wife's three pregnancies have resulted in miscarriage. A sister, aged 45, also unmarried, has hypertension, and as a girl had an ulceration of the rectum which only healed after a very long course of treatment and was followed by a slight stricture. A married sister has suffered from headaches for years, in addition to a number of symptoms common to neurasthenia. A younger brother, aged 36, is apparently in good health. The three sisters and the apparently healthy brother all gave negative Wassermanns, but the sister with the highest blood-pressure, the neurasthenic, and the brother who seemed well, all gave positive luetin tests. The other brother has not been tested. The family history apparently gives the clue to the situation.

The father had died from a "tumor of the throat," the mother, from acute cardiac dilatation complicating pneumonia, at 52. Her first pregnancy resulted in a miscarriage. One of her brothers died of "apoplexy" at 17, and a sister who had not had rheumatism, of heart-disease at 38. Three of the mother's sisters—all unmarried—are still living. One appears to be in good health but gives a positive luetin test though her Wassermann is negative. Another, now past 60, has hypertension and several years ago had a slight stroke of apoplexy. A third, not as yet examined, was a 7-months baby and is stated to suffer severely from dyspnea on exertion. The maternal grandmother died of apoplexy at 64 and her husband at the same age of a "fatty heart."

It is especially fortunate that there were so many unmarried women in two generations, as this practically eliminates acquired infection.

This family suggests syphilis in three generations. There is no proof that the mother of the present generation, who died of cardiac dilatation after pneumonia, had lues, other than the presence of syphilis in her children. Of course it cannot be said that she might not have been infected by her husband, who may possibly have had syphilis. But the astonishingly large number of cardiovascular cases in her own generation and the positive luetin test in an unmarried sister makes the assumption that she had a congenital (myocardial) syphilis almost a certainty.

In this connection the statement might be made that an underlying and unsuspected syphilitic myocarditis is probably a more frequent cause of cardiac death in the course of other infections than we have hitherto supposed.

It would seem from this investigation that the luetin test is of more value in detecting congenital infection of long standing than the Wassermann test. This is especially true when the disease is dormant. Emory[12] has also noted this fact. Whenever possible both tests should be employed as neither is infallible. Nor does a positive Wassermann or luetin reaction guarantee that the presenting symptom is due to syphilis. In four cases the luetin test was negative, while the Wassermann was positive. In one, both tests were negative. Had cholesterinized antigens been generally employed, it is quite possible that the percentage of positive results would have been somewhat higher; but the luetin test was positive several times even when fortified antigens were used. The ideal method of procedure is first to obtain blood for a Wassermann and then either give mercury by mouth for a week, when the luetin test should be made, or the interval may be shortened by an injection of mercury at the time the luetin test is given.

The torpid reaction, coming on in from ten days to three weeks is common. Since using mercury in conjunction with the luetin test the indefinite reactions are rare, nearly all going on to pustule formation.

Time will not permit the discussion of the luetin test *per se* as an indication for therapeusis when occurring without obvious lesion. Nor can treatment be considered other than to say that relief of symptoms has been complete in a number of cases in which the Wassermann was persistently negative with the luetin positive. In a few there was a slight recurrence several months later, which usually promptly responded to further treatment. Whether a cure in its strictest sense is possible, only time will tell.

CONCLUSIONS

1. We must accustom ourselves to think of syphilis as a family disease. But rarely is our patient the only one infected.

2. Over half of the children born of syphilitic parents, who survive infancy, give a positive luetin reaction. In nearly 90 per cent. of those with obvious ailment the Wassermann or luetin test is positive.

3. There is often nothing in the appearance to suggest lues and the symptoms are indefinite and often misleading.

4. Too much emphasis cannot be placed on the importance of a complete family history in every obscure case.

5. It seems probable that syphilis may be transmitted to the third generation.

6. Some cases of neurasthenia are due to congenital lues and can be promptly cured by specific treatment.

7. Syphilis appears to be an etiologic factor in certain of the families prone to heart and arterial disease.

8. Hypertension in middle life may be due to congenital lues.

9. Both the Wassermann and luetin tests should be employed as neither is infallible, the Wassermann being frequently negative in syphilis hereditaria tarda, the luetin occasionally so.

10. Cassel, quoted by Murphy and Powers (Footnote 11).

11. Murphy and Powers: System of Syphilis, Oxford Univ. Press, 1908, i, 358.

12. Emory: Lancet, London, 1914, i, 223.

10. The examination of all venereal sores for spirochetes and their prompt treatment, controlled by the Wassermann and luetin tests, would ultimately make congenital syphilis a medical curiosity.

It is with pleasure that I acknowledge a number of valuable suggestions in the preparation of this paper from both Dr. Noguchi and Dr. Ellis of the Rockefeller Institute.

75 Pratt Street.

ABSTRACT OF DISCUSSION

DR. ROBERT N. WILLSON, Philadelphia: Because of Dr. Cabot's challenge to the effect that "if I would show him a mitral stenosis with an etiology other than that of rheumatism he would believe in it" I present to the Section two hearts, both showing, as late manifestations of hereditary lues, a high-grade stenosis of the mitral valve in addition to other extensive involvement. In the one case the latter consisted of a ruptured aneurysm of the thoracic aorta in a child of 4 years, and, in a second, of considerable patchy atheromatous involvement of the first portion of the aorta, though the aortic valve leaflets were normal. In neither case was there at any time an indication of "rheumatic" involvement in any of its forms. In both cases (the child and adult), one parent and probably both were syphilitic. I think the final test as to the direct etiology of such cases could and should be successfully demonstrated in the post-mortem discovery of the spirochetes, as well as by the Wassermann test during life. There would, however, seem to be little need for such an ultimate study in the specimens presented at this time. Dr. Stoll's paper brings to our attention once more the growing need of assigning to syphilis a place equally as prominent as that of rheumatism in the causation of valvular lesions, and a far more significant influence in the etiology of arterial lesions and consequent secondary changes in the muscle of the heart. I have seen many little children with no other sign of syphilitic parentage than fibrous, whipcord vessels, those of little old men and women. In fact I have come to regard arteriosclerosis in the child as highly indicative of hereditary lues, even in the absence of all other symptoms. If such a heredoluetic survives and marries, his or her children are not unlikely to present congenital cardiac lesions which should be, though they often are not, attributed primarily to syphilis. Dr. Stoll has cited in his series an instance of mitral stenosis in a young adult female, presumptively luetic in origin. This case resembles closely in its clinical details the case in an adult represented by one of the specimens shown. One point seems to me well worth remembering in connection with these cases, namely, that many instances of arterial and cardiac disease are characterized as congenital or of unknown etiology, when a more thorough and painstaking study of the anamnesis would correctly label the lesions as heredosyphilitic or even acquired syphilis.

DR. A. C. GRIFFITH, Kansas City, Mo.: I have been using the luetin test for some time. When in New York a short time ago I asked Dr. Noguchi why it was that at times the luetin test was negative when we had a positive Wassermann? He answered that it was because the system was so saturated with the toxin or the poison from the spirochetes in the body that the luetin was rendered inert. If the patient was placed under treatment with mercury or salvarsan the tests all became positive.

The Many Sidedness of Science.—It is well that the sciences of nature hold out attractions to so many different types of mind, for the edifice of science is built of material which must be drawn from many sources. A quarry opened in the interest of one enriches all of these sciences. The deeper we can lay the foundations and penetrate into the nature of things, the closer are the workers drawn together, the clearer becomes their community of purpose, and the more significant to the welfare of mankind the upbuilding of natural knowledge.—Welch.

LATENT AND TERTIARY SYPHILIS IN DISEASES OF THE NOSE AND THROAT *

CHARLES R. C. BORDEN, M.D.
BOSTON

The importance of the diagnosis of syphilis in any part of the body cannot be overestimated. In the primary and secondary stages, syphilis is a serious matter; in the tertiary stage of nerve lesions it is a calamity. Recent statistics state that 20 per cent. of treated patients and 40 per cent. of all afflicted with the disease later develop nerve lesions. Until recently, we were unaware that the spinal fluid in certain cases contained active manifestations of the disease when the blood was negative. To-day it is possible, not only to demonstrate spirochetes in the spinal fluid, but also to treat this important field with most promising results.

Tertiary lesions in the nose and throat require early diagnosis for two highly important reasons: first, because their presence demonstrates an active syphilitic process in functionally important organs, and, secondly, because the general systemic infection causing localized symptoms in the nose or throat may later develop still more serious lesions in the central nervous or arterial systems. Specific manifestations in the larynx, soft palate and nasal septum are rapidly destructive; thus it is highly important that they be recognized and properly treated before actual destruction takes place.

In certain virulent cases the destruction of these delicate organs is a matter of hours. From twenty-four to seventy-two hours may cause sufficient destruction to seriously impair their function for all time. Thus salvarsan, despite its marvelous rapidity and efficiency, can avail nothing if destruction has taken place before the diagnosis is made and the treatment given.

Symptoms of tertiary syphilis in diseases of the nose and throat include all manifestations of the disease which are of a destructive nature, and are not necessarily limited to the time of appearance with reference to the initial lesion. It is possible to have primary, secondary and tertiary syphilis at one and the same time. For example, an untreated chancre of the lip may develop into the malignant type and cause deep ulceration. When such a lesion is present, the delay in treatment allows a systemic infection which gives rise to secondary symptoms in the glands, skin, throat, etc. The moment an initial or secondary symptom becomes destructive to any serious amount of tissue, the lesion becomes a tertiary one. Thus, we have to all intents and purposes all three stages present at one time, that is, the original site of the infection as the primary stage, systemic manifestations in the glands, skin, throat, etc., as a secondary stage, and a beginning destructive process in the initial lesion as a tertiary stage. In this respect, also, so-called secondary lesions of the cartilaginous septum, which are not uncommon and are rapidly destructive in their action, are not secondary at all, but are true tertiary lesions despite the fact that they occur in the interval commonly regarded as the secondary period. Practically speaking, however, tertiary symptoms include all manifestations occurring after the commonly accepted secondary symptoms have passed.

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

The ordinary tertiary symptoms in the field of the rhinologist and laryngologist are too well known to need further mention. In my opinion, they are far more common in diseases of the nose and throat than they are supposed to be. My experience and that of my friends has recently taught me to use great caution in making a diagnosis in a given case until syphilis has been eliminated as carefully as possible. To further this end, instructions have been given to do a Wassermann test on every patient admitted to the wards of the hospital on my service, and on every operative case in the outpatient department wherein syphilis might enter as a complication.

From a purely scientific standpoint, latent syphilis cannot exist. An individual either has the disease or he is entirely free from it. If spirochetes are present anywhere in the system, he has syphilis. If no spirochetes are present, the opposite condition is true. Symptomatically, however, there is often a quiescent period in the disease in which no active lesions are present, regardless as to whether the Wassermann test is negative or positive. For want of a better term, we may usefully and properly refer to this stage of the disease as "latent syphilis."

Latent syphilis is a particularly important matter in nose and throat practice inasmuch as operations in that field may rapidly change the latent disease into a very active one. This has happened to me in both private and hospital practice and has caused considerable distress to the patient and anxiety to the operator. To operate on a patient with latent syphilis without knowledge of its presence is a serious error and one which should be guarded against to the best of our ability. Judging from my experience and that of other Boston rhinologists, I strongly believe that we have no moral or legal right to perform a destructive operation of any magnitude on the nose or throat until a Wassermann test has been made. If doubt still exists in our minds as to the presence of syphilis because of an uncertain Wassermann test, we must proceed still further and make other tests which have proved to be valuable agents in the diagnosis of this disease. Operating on a patient with latent syphilis has exactly the same effect as the so-called "provocative test," but unlike that procedure, it has no power to overcome the mischief it has liberated. One of my cases, that of a catilaginous transplant into the nose, developed a tremendous syphilitic reaction within forty-eight hours. The patient had shown two negative Wassermann reactions, one six months and the other one week before the operation. Forty-eight hours after the operation, the wound showed evidences of infection. The inflammation was not especially active for the first few days, but then a marked redness and swelling developed, which extended to both orbits. It had every appearance for a short time of erysipelas. Ice compresses soon reduced the extreme swelling, however, and after several weeks of active inflammation the pus discharge ceased. Then the nose from the nasal bones to the tip became moderately swollen, with a shiny, fiery-red color which gave a most unhealthy appearance. Hot poultices were applied without the desired results. Several incisions were made with the hope of liberating confined pus. None was obtained. The shiny, red color and swelling persisted for over four weeks, then gradually subsided and never returned.

Young children who have inherited syphilis in either the secondary or tertiary stages are beginning to receive the proper attention which has previously been denied them. Many hospital clinics are now especially interested in this phase of the situation and astonishing results are being obtained. Of 111 cases admitted to the Children's Hospital in Boston, Lucas found 31 per cent. to have syphilis. Churchill, in Chicago, found over 30 per cent. These statistics led me to order a routine Wassermann test done on every child in my clinic who showed a tendency to chronic bone involvement, particularly of the mastoid variety. Since my connection with the Boston City Hospital, there have been many such cases and I am sanguine as to the results which may be obtained in this direction. In children, the Wassermann reaction is not at all to be depended on, particularly when bony tissue is involved. All the older symptoms in the skin, bones, teeth, eyes, etc., must be carefully sought for in case the Wassermann test is doubtful or negative. Nasal symptoms are not uncommon in children. Three cases of suspected foreign bodies in the nose have come to my attention, all of which proved to be specific disease and not foreign bodies. In all three cases there was a fetid odor and increased secretion, but there was little or no swelling of the soft parts of the nose. This is the opposite condition to what is found in the case of a foreign body, and is a strong point in the differential diagnosis. On the whole, children react well to treatment in this disease.

The value of the Wassermann reaction depends on the period of the disease at which it is taken. It has no value in the primary stage. As soon as the disease manifests itself in the general system, it develops its full strength. The effect of previous treatment with mercury is to give a negative Wassermann reaction; hence, a negative test is not positive evidence that syphilis is not present. The effects of previous treatment, moreover, may extend over a period of years and give a negative test in the tertiary period. The situation is still further complicated because in the latter stage of the disease lesions in bony tissue have a strong tendency to yield a negative Wassermann test even in untreated cases. This is an important point in tertiary lesions of the nose inasmuch as such lesions usually occur in the bony tissue. The Noguchi test is practically the same as the Wassermann. A large number of the two tests were carried on together by Dr. Sanborn in the Boston City Hospital, and the results were equal in every way. On the other hand, the luetin test is occasionally positive when the Wassermann test is negative. In such an event, the result of the luetin test may be given the preference.

In the event of a doubtful Wassermann reaction, another method of diagnosis is available which is a positive sign when present. The bones may show certain characteristics which are distinctly syphilitic

The pathologic changes exhibit a variety of forms which, in exaggerated cases, may be determined by the sense of touch. There may be a distinct area of softening due to a broken-down gumma, or a thickening or roughness which may be determined by the fingers. The Roentgen ray will determine less-apparent lesions in the bones to the expert who is able to read them accurately.

Periosteal thickening may be circumscribed, single or multiple, and the thickened periosteum may be on one or both sides. Endosteal thickening, while less common than periosteal, is occasionally seen and when present is strongly diagnostic of syphilis. Dactylitis in children may be looked on as a very possible symp-

tom of the disease. Specific bone lesions are not limited to the long bones but may occur in any part of the osseous system. Specific infection in the ribs and rib cartilages is not infrequent.

In the cartilaginous rib transplant case previously mentioned, which Dr. Emerson and I performed together, the cartilage obtained from the sixth rib showed marked signs of having been diseased. We supposed at the time that it was sufficiently healthy for the purpose because of the negative Wassermann reaction. As a matter of fact, it did finally graft into place, but it required over three months to do so. I doubt, however, if the long inflammatory period was due to the cartilage, but to the extreme irritability of the tissues surrounding the cartilage when placed in its altered position.

Syphilitic bone lesions are particularly valuable guides in diagnosis for the reason that such infections are prone to give negative Wassermann tests. Expert syphilographers assert that perhaps not more than one case in three of bone syphilis exhibits a positive Wassermann. This phase of the situation is especially important to rhinologists, because a false diagnosis is easily possible if a Wassermann test alone be depended on.

A number of cases in the hospital which have given negative Wassermann tests have yielded quickly to salvarsan. One case of multiple sinusitis was negative to a provocation test, but immediately showed great improvement after the test was made, owing undoubtedly to the small dose of salvarsan given in the test. In fact, this particular patient was practically cured by a procedure which was instituted wholly for the purpose of diagnosis. From a diagnostic standpoint, it failed utterly to demonstrate a syphilitic process; but, for the time being, at least, it cured the patient's headaches and dried up a pus discharge which had been continuously present for many months. Another patient who had had several frontal-sinus operations (one of them a complete Killian) failed to respond to treatment for many months. The case occurred a year or more before salvarsan was known. Later it was one of the first cases of its kind treated with salvarsan in our hospital, and the results were most satisfactory.

The provocative test consists of giving a small dose of salvarsan and then making a Wassermann test. The theory is that the salvarsan breaks down the walled-off process and allows the spirochetes to enter the circulation. Bone lesions, in particular, respond to this test and it is an extremely important factor in nose and throat diseases for this reason. In my opinion, all chronic sinus cases should be given this test in the event of a negative Wassermann before any extensive operation is attempted. I know of two cases, which later proved to be specific, in which extensive and mutilating operations were performed on the nose and face. They occurred before the day of this test; but had it been available, both operations might have been unnecessary. In another recent case in which there are decided nasal symptoms, there was a negative Wassermann, but the history of the patient gave the father's death as due to locomotor ataxia. This clue to a possible specific taint was deemed sufficient to demand a provocative test. At the time of writing the result is unknown.

Acute postoperative reactions of a syphilitic nature are not as common as we might suppose. They do occur with sufficient frequency, however, to make them an important element in our work. I have actually seen but few such inflammations following septal operations. I have had two such reactions in private practice following sinus operations and two following cartilaginous transplants. In the latter, one patient previously mentioned had two negative Wassermanns before the operation. The other patient gave the cause of her nasal deformity as traumatic in its origin and we took her word for it. A violent reaction took place and persisted for many weeks. At first, we viewed the situation as an ordinary infection and treated it as such without relief. Finally, in desperation, we tried a Wasserman reaction and found it three plus positive. The case reacted well to salvarsan, but in spite of that treatment repeatedly given, combined with mercury, the Wassermann reaction is still positive though the wound has long since healed.

In the hospital clinic, a considerable number of sinus cases refused to clear up well after operation. The patients continued to have pus, granulation tissue and headaches in spite of continued operative treatment. Later, salvarsan was given with satisfactory results.

My attention was recently called by Dr. Sanborn to tonsil operations in syphilitic patients. It appears that a considerable number of such patients have been operated on with decidedly harmful results. Dr. Abner Post, who is known the world over as an authority in all matters pertaining to syphilis, informed me in a recent conversation that many children with hereditary syphilis are operated on for adenoids and the results of such operations are very injurious. Dr. Post further called attention to the fact that children with hereditary syphilis usually present the picture of adenoids and are thus liable to have such operations performed on them even if no adenoid tissue is present. I know of no special case of either adenoid or tonsil operation on a syphilitic subject. Doubtless such cases have occurred but I failed to recognize them.

Occasionally, for no apparent reason, an inflammatory process will follow operations on the nose or throat. We have previously supposed that such an acute reaction was due to an ordinary infection. Doubtless, some of them were syphilitic patients and that disease was the primary cause of the postoperative inflammation. Here arises another phase in the situation which is new to me.

It appears that postoperative inflammation, either acute or semiacute, is not alone due to syphilitic infection but to a double infection. In very destructive lesions, it is not the spirochetes alone which destroy the tissues, but other pus organisms which are also present acting in conjunction with them. For example, in the event of an ulceration of the larynx or the cartilaginous septum, the spirochetes attack the structures to the extent of greatly reducing their vitality. Into this fertile field come other germs of a virulent nature, and an exceedingly destructive inflammation results. This theory is proved by the evidence of systemic infection which is often present. If the case were one of the spirochetes alone being active, temperature and symptoms of septic absorption would not be present. Doubtless, when the inflammation is chronic and not especially active, either the spirochetes are acting alone, or with other bacteria of a low-grade variety. In chronic sinus cases, probably, both spirochetes and low-grade pus organisms work together, as the semiacute inflammation is too great for the spirochetes alone and too slow a process for organisms of the streptococcus variety.

Whenever a postoperative inflammation develops in our field, it is well to have a Wassermann test made immediately. If the seat of inflammation is in the soft palate, larynx or septum, the destruction is so rapid that permanent injury will result very quickly. Twenty-four hours' delay in accurate diagnosis may result in great deformity or loss of function before the proper treatment is given. I know of one case in which both sides of the mucous membrane sloughed away in twenty-four hours from a postoperative syphilitic inflammation following a septum operation. This was a case of latent syphilis presenting no evidence of the disease prior to the operation, but a very active process set in immediately afterward. Salvarsan speedily overcame the inflammatory reaction, but was given too late to prevent a large perforation.

The profession still has much to learn about syphilis. Many marvelous cures have been made, so far as symptoms are concerned, but who can tell of one patient who is cured for all time? Cases are known which after having been treated with salvarsan gave negative Wassermann reactions and the patients were supposedly cured, yet later developed most serious nerve lesions. At present, the question of cure is unknown. Expert syphilographers feel hopeful regarding patients in whom proper treatment has been given in the primary or early secondary stages. A number of such individuals have had reinoculations of the disease, which naturally is the best possible indication of a permanent cure. It is doubtful, however, if reinoculation ever occurred in the tertiary stage of the disease.

Salvarsan alone is not to be relied on. Mercury must be used in conjunction with it over a long period of time. A negative Wassermann reaction, after treatment, by no means indicates that a cure has been effected. Every syphilitic patient must be under observation for a longer period of time than salvarsan has existed as a specific remedy before any definite opinion may be given as to the final outcome of the case. The proper diagnosis and treatment of syphilis is a specialty by itself. The average physician, surgeon or specialist has too little experience with the disease to care for patients who are so afflicted, and it is far too important a matter for half-way measures in the hands of physicians of limited experience with this particular disease. The rhinologist and laryngologist should learn as much as possible of the syphilitic lesions which develop in his daily work; but very few specialists in this field are good syphilographers; consequently they should, if possible, refer such patients to other physicians whose experience has fitted them to be well versed in this very important branch of medicine.

In closing, I wish to express my sincere thanks to Drs. Post, Sanborn, Whitney, Nichols, Howard, Cotton and Herman, all Boston physicians and surgeons of wide reputation in their special fields of work, for the information given me pertaining to this subject.

520 Commonwealth Avenue.

ABSTRACT OF DISCUSSION

Dr. Joseph C. Beck, Chicago: The most important point, perhaps, is that there should be a routine Wassermann test on every patient we are going to operate on and I am thankful Dr. Borden brought up this question. It is not difficult to have a routine Wassermann reaction at this time and by it we may be spared a good many of the complications that Dr. Borden has mentioned. With regard to tertiary syphilis and gumma, being so early as mentioned by Dr. Borden, I think that is not to be expected, as these changes take considerable time; for instance, endarteritis. The aid of the Roentgen ray, as Hickey of Detroit brought out in connection with disease of the tibia, is important. Even in the presence of a negative Wassermann, thickening is frequently found on the anterior portion of the tibia. The provocative test has been a disappointment to me in a large measure, though in some cases it may be a help. Last year, in our discussion, the point was made that we should be criticized for a perforation in the septum after a submucous operation, and I know of an instance in which a statement of that kind resulted in considerable trouble to a physician when the result may have been due to syphilis and not to any fault of surgery. With regard to transplants, I have had the same thing happen that Dr. Borden mentions; not with cartilage, but with bone; I never use cartilage because it becomes absorbed; but using the rib I had a condition of that kind.

Dr. W. W. Carter, New York: I wish strongly to endorse the point made by Dr. Borden with reference to the operations on bone in syphilitic subjects. I have had much experience in the transplantation of bone in the correction of nasal deformities and I have always endeavored to be absolutely certain that no active syphilis was left in the patient who was to be operated on. I have had in nearly all my cases two Wassermann tests made; but on three occasions, even after two Wassermann tests had proved, as much as a Wassermann can prove, that syphilis was absent, I had failure in transplantation of the rib for nasal deformity. The failure was not due to extraneous infection but to the effect of the syphilis on the tissues in which the transplant was made. The effect is very distinctive of syphilis at the location where the bone was placed. It did not show a purulent infection, but the tissues were very much thickened, discolored in a peculiar way, a sort of bluish red, and at first a serous bloody discharge came from the area where the transplant was placed. Subsequently this became infected and the transplant had to be removed. In each of these cases there was evidence in the rib, when I cut down on it, that the patient had been thoroughly saturated with syphilis. The rib was almost entirely cancellous tissue, and you will find in the old syphilitic cases that the bone has this appearance; the amount of compact tissue in the rib is very much diminished. I split the rib and scraped out the cancellous tissue and in this case the compact bone left was almost as thin as tissue paper. We should not do any bone operation in a case in which we are not absolutely certain that there is no syphilitic infection.

Dr. John O. Roe, Rochester, N. Y.: I agree with Dr. Borden in every particular, excepting the necessity of making a Wassermann test before all nasal operations are undertaken, which he so strongly advises. Such a test should certainly be made in all cases of suspected lues, or in all sinus operations, in which the cause of the trouble might be in doubt, but to lay down the hard and fast rule that it should be made in all cases before all simple operations, when there is no history or suspicion of a specific complication or association, would be not only unnecessary, but also might often give a critical or designing patient an opportunity to make trouble for the surgeon, in case something happened to interfere with the success of the operation. By way of illustration, if a perforation followed a submucous operation, when the cause of the deviation was unquestionably traumatic, or if unexpected complications should arise, the omission to make the test in compliance with a fixed rule, would again give the patient an opportunity to make trouble for the surgeon. There is, however, one class of cases in which a Wassermann is of great assistance and usually a necessity for the surgeon to determine the presence or absence of any active manifestation of a specific nature. This is in those cases of nasal deformity, attended with more or less destruction of tissue, the result of specific causes. Before undertaking any plastic operation in these cases for the correction of the deformities, it is important to determine the presence or absence of any activity of the constitutional disease.

DR. JOHN F. BARNHILL, Indianapolis: I wish especially to commend that portion of Dr. Borden's paper which tells us that we should be cautious to learn all there is to know about our patients before we operate. I have seen two patients in the last ten years who have been seriously injured by operative procedures having been carried out while a syphilitic condition was present. One young lady completely lost her nose as a result of such an operation. I saw recently a child 13 years old on whom some tonsil work had been done. The child had lost pretty nearly all of the soft palate and a portion of the hard palate as the result of the operation, which was unwarranted because of the condition of the child. As a rule laryngologists are not so cautious in the preparation and examination of their patients as the general surgeon is. It is pretty certain that a patient can drop into almost any laryngologist's office and get a septum operated on or the tonsils removed, or almost any other thing done in the nose and throat on the same day he comes, provided the laryngologist has the time to do it. Dr. Borden's paper, I think, warns us very decidedly against this procedure. We have perhaps seen where we might have been benefited had we followed the advice he has now given us. He goes rather far, perhaps, in stating that latent syphilis is always, if I understand him right, a contra-indication to any sort of operative work in the nose and throat. If such were the case I am sure that all of us would have had many more calamities than we have had, because all must have frequently operated on these patients without any knowledge of the presence of a latent syphilis. I recently saw a case of well-marked tertiary syphilis in which several physicians of repute had repeatedly examined the throat without discovering the presence of a latent lues of the soft palate. This patient had apparently been well for a long time. I think this must be quite a common experience.

DR. OTTO T. FREER, Chicago: I agree with Dr. Roe that to ask for a Wassermann test before every nose operation would be an excessive and unreasonable demand. We should, however, as heretofore, always be on the watch for syphilis. I wish to call attention to the deceptive nature of the frequent mild and very slowly destructive forms of tertiary syphilis found in the nasal cavity and which contradict the common belief that tertiary syphilis in the nose is always a rapidly destructive disease. A common type of mild tertiary nasal disease is smooth infiltration of one side of the septum which exaggerates existing ridges or slight deflections into the appearance of a pronounced septal deviation with occlusion of the affected naris. The mucosa over the swelling is smooth, pink and deceptively normal in appearance. Minute inspection after adrenalin shrinkage, however, almost invariably discloses a small shallow ulcer or granulating patch, while the absence of a concavity of septal deviation in the other naris excludes a true deflection of the septum from the diagnosis. Two such patients have been sent to me for a submucous resection. Another form of mild hypertrophic tertiary syphilis is syphilitic hyperplasia of the inferior turbinate. It may so strikingly resemble the ordinary finely nodular true hypertrophy that it may be mistaken for a catarrhal product. Here, too, the presence of slight ulceration somewhere is usual and gives the clue to the nature of the affection. A third type of non-destructive tertiary syphilis is indolent ulceration of the vault of the nasopharynx. There is no clean-cut destructive ulcer such as text-books describe as typical, but instead a granulating, ill-defined superficial one resembling degenerating adenoid remnants in the adult. I have seen grave cerebral syphilis with paralysis of the abducens and facial nerves of one side, headaches and symptoms of the syphilitic pachymeningitis follow a syphilitic infiltration of the pharyngeal vault of this kind, and think that the diseased area was continuous with gummatous products above it in the middle cranial fossa, communication taking place through the foramina at the base of the skull. The three conditions I have described are not rare and should be watched for.

DR. E. J. BERNSTEIN, Kalamazoo, Mich.: I think we should thank Dr. Borden for calling our attention to the fact that we ought to make a Wassermann test very frequently, but it seems to me to be going too far to say that we should have a Wassermann in every one of our nasal operations, for, if that were true, and we go on record that such should be done, a lot of disastrous results may happen if it is not done, and it is practically impossible in every case. If it were absolutely true that we run such a great risk, what in the name of common sense would account for our good results that we have been having in our operations for the past ten or fifteen years? I recall a case in point in an actively syphilitic patient, a man with an ulcerated nose. I had a Wassermann test which was negative. He had occlusion of the nares, which I thought might be the cause of the ulcer, in view of the negative Wassermann. I did a submucous resection of the septum and got a perfect result. I have no doubt many could recall similar experiences.

DR. HENRY HORN, San Francisco: An interesting thing about this discussion has been the extremely pessimistic way in which every one has spoken of the Wassermann reaction as an aid. A series of experiments has been carried out by a neurologist in San Francisco, who has found, as have many others, that the Wassermann reaction is a help when positive, but, when negative, absolutely not to be depended on in a great proportion of cases. Very recently, a Wassermann reaction was taken on a certain patient in which the blood was divided into two parts and both specimens were sent to the same laboratory; one came back with a negative report and the other positive. A point I would make is that we are too apt to depend on the Wassermann reaction. I simply sound a note of warning in this respect. I would call attention to three manifestations of tertiary lues: first, a peculiar, dry, postnasal catarrh, which is a latent syphilitic manifestation; a dry, shiny catarrh which doesn't respond to treatment. In these cases if we employ salvarsan we get rapid results. Secondly, a hypertrophic postnasal catarrh, like a pharyngitis granulosa. Thirdly, a peculiar type of antrum trouble, a non-infectious type in which the antrum is filled with a clear, non-purulent mass, of a gelatinous consistency that is easily overlooked in the washings.

DR. HUDSON MAKUEN, Philadelphia: I report a case illustrating the importance and the unreliability of the Wassermann test. The patient, a beautiful child of 4 years, came to me with an aphasic condition. He developed speech normally at 2 years; could say such words as automobile, elevator, etc., but gradually lost speech entirely and at the the age of 4 was aphasic. He had been examined previously by several physicians and one had diagnosed his case as of muscular dystrophy. Not only was there aphasia, but the condition simulated juvenile insanity; the child had no concentration; paid no attention to anything brought before him. His father and mother came to town and I found that the father was in the first stages of paresis; all his muscles were affected. He was referred to the neurologist and it was decided to use the Wassermann test. I was told that it had been used six months before with negative results, but at this time he showed a positive reaction and that gave us a clew to the child's condition. We then had a Wassermann test on the child, and also included the mother. She was a nervous woman with various vague complaints, and she gave a positive reaction also, while the child gave a negative one. Notwithstanding that fact, we all concluded we were dealing with a syphilitic child. I mention this case to show that the one in which we should have expected a positive reaction gave us a negative one, while the mother who had no very marked symptoms gave a positive reaction.

DR. P. SCHOONMAKER, New York: The Wassermann test would be of far greater value if its findings were more definite. While the double positive reaction shows a syphilitic infection, a negative does not assure us that the disease is not present. Only recently I had an adult with nasal obstruction due to a badly deflected septum requiring an operation for its correction. He was rather pale and anemic, the functions of the body were normal, history negative, and no symptoms of a systemic infection. I considered his condition due to the deflected septum causing poor aeration. A submucous resection was done, the result being excellent, there

being no perforations or lacerations. The coaptation of parts was perfect. The nares were packed with aseptic gauze holding the parts well together; packing was removed in forty-eight hours; parts looked healthy. The patient did well for four days, on the fifth day the septal wall looked bad, and a day or two later the entire septal wall in site of operative field sloughed, leaving a large perforation. At this time a swelling in the nasopharynx was discovered. I was at a loss to account for this condition. Suspecting that latent syphilis might be present I had a Wassermann test made, which was negative. Nevertheless I put him on a mixed treatment and asked for consultation. Two specialists in rhinology saw him with me, and notwithstanding the history and negative Wassermann concurred in the opinion that the condition was one of tertiary syphilis and advised appropriate treatment. Under full doses of mercuric iodid and potassium iodid saturated solution, in increasing doses, up to 35 grains three times a day, there was rapid improvement in his condition. Wound healed nicely, the general health was better and case soon cleared up. The patient gained in weight and strength and said he never felt better.

DR. NORVAL PIERCE, Chicago: I have operated on syphilitic noses and have had just as good results as in the non-syphilitic cases. I do not mean that we should operate in the presence of active syphilis. I had one patient, a young woman, unmarried, anemic, undoubtedly virtuous, who had recurrent hemorrhages from the nose. The epistaxis was due, as I thought, to a deflection of the septum; there was an erosion of the septum on one side. After the deviation was corrected everything went all right until about a week after the operation when she had a violent hemorrhage from the nose which came from some point well back and was very profuse. The nose was packed, the hemorrhage ceased and the patient recovered. A short time after that she came into the hands of Dr. Webster suffering from menorrhagia. He eventually performed a hysterectomy and found, on section of the uterus, a marked endarteritis. He informed me that there had been two Wassermann tests, both positive. I believe hemorrhage from the nose in children is suspicious. I have had recently two cases of ordinary epistaxis, in one of which, knowing the father to be a man of very liberal habits in his youth, I had a Wassermann done, and while he had no symptoms of syphilis, there was a marked positive reaction in the child. May not these be cases of syphilitic endarteritis very often? I think, however, it should not go forth from this section as our opinion that we should have a Wassermann test before every nasal operation.

DR. L. W. JESSAMAN, Framingham, Mass.: I reported a case in a colored woman with sinus trouble seen three years ago, in which no history of syphilis could be obtained. A few days later the patient developed a swelling at the inner canthus of the right eye and a diagnosis of ethmoiditis was made. She was operated on, the ethmoid cells cleared out and the patient did well until some time afterward when she returned with a swelling at the lower margin of the left orbit, and another on the right side of the nose below the lower margin of the orbit. A diagnosis was then made of gumma, and the condition was very quickly relieved with the administration of mercury and potassium iodid.

DR. DUNBAR ROY, Atlanta: In my clinic in the South I have a great many negroes, and syphilitic manifestations in the nose and throat in this class are very prevalent. The northern men hardly know what these manifestations are until they have seen these cases in the South. You can find the lesions from the nose down to the epiglottis, but I rarely ever see a gummatous condition in the larynx. I never find the epiglottis entirely ulcerated away. Another point I would call attention to is to have a Wassermann test made in the cases of vasomotor rhinitis that come to us. In three out of ten such cases of engorgement of the nose, I have found a late secondary manifestation of syphilis. I always have a Wassermann made in these cases and it is surprising how they will yield to antisyphilitic treatment. I believe in a large number of these cases there is a syphilitic basis.

DR. EMIL MAYER, New York City: A woman came to see me with the story that she had been under the care of some of our best physicians and that they had diagnosed a condition of gall-bladder trouble. She wanted me to give her the address of another man to consult, and said, incidentally, "I have a little sore in my nose. Would you look at it while I am here?" I made a nasal examination and said, "I think you will find the whole cause of your trouble due to this condition in the nose." I sent her for a Wassermann test and, as I suspected, it was positive.

DR. JOSEPH C. BECK, Chicago: I hope I did not give the impression that I think it is necessary to have a Wassermann test in every case of nose or throat operation; only in suspicious cases in which the findings are not definite of lues.

DR. C. R. C. BORDEN, Boston: Someone has taken the ground that I overestimate the importance of latent syphilis. Last week at the meeting of the Laryngological, Otological and Rhinological Society I was asked how I dared etherize a patient who had acute congestion of the kidneys. I would have much less fear of such a kidney complication than I would in operating on a patient with latent syphilis in a delicate organ of special sense. In answer to Dr. Bernstein, doubtless a great many nose and throat operations have been performed with splendid results with no trouble from active or latent syphilis. On the other hand, serious complications have been known to follow in a sufficient number of cases as a result of syphilis to make it worth while to use proper precautions in all serious cases. I hope I have not given the impression that I have much faith in the Wassermann reaction, for I have not. I went through a great deal of trouble to get the latest ideas of the leading Boston syphilographers on the subject under discussion in order that I might present the other methods of diagnosis which are available for syphilis. Taking the subject as a whole, I appreciate the fact that it is not possible to have a routine Wassermann in every case, but all the larger hospitals are rapidly coming to it. We must consider that syphilis is a wide-spread disease and one which is the real cause underlying many diseased conditions in every field of medicine. Of course, in private practice, it would be impossible to have a routine Wassermann in every case, but in operations which are very destructive or mutilating a Wassermann test should always be done first. In fact, in my own experience, the procedure of the Wassermann reaction has more than once made such operations unnecessary.

A NEW METHOD OF REFLEX ELICITATION

PRELIMINARY REPORT *

WALTER B. SWIFT, M.D.
BOSTON

After completing four or five researches on different phases of reflex action during which some two thousand observations were made, and after seeing several diagnoses made wrongly on what seemed to be misinterpreted or insufficient reflex data, I came to the conclusion that there was a crying need of a more efficient mode of reflex elicitation available for application in exceptional cases.

I tried first to improve present methods of elicitation. To that end I visited Jendrassik in Budapest and obtained personal instruction as to his method of applying the hand-grasp. I put this into practice in many cases at the Boston City Hospital and when I found his technic an improvement over our own I

* From the Neurological Department of Boston City Hospital, Service of Prof. John Jenks Thomas.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

published the results.[1] Innumerable attempts to improve old methods met with failure. Then I began to search for some entirely new avenue of approach. I felt the need of another method not only for its worth in clinical routine examination, but also to enhance the value of my researches in reference to reflex frequency,[2] and other reflex propositions not as yet published.

Therefore a series of reflexes were tried during and after the passage of the electric currents—galvanic and faradic. My sincere appreciation is due to Dr. John J. Thomas for opportunity to carry on this research at the Boston City Hospital. Minutely the problem was as follows:

THE PROBLEM

Galvanism and faradism, strong and weak currents, were passed in cases of normal, exaggerated, pathologic and absent reflexes. Although this research is still in process, sufficient positive data of value have been obtained to warrant the presentation at this time of several new facts in the form of a preliminary report.

A. I find that with weak faradic current, *normal reflexes* change as follows:

The Triceps: Unchanged in 3 cases. Made more pronounced in 3 cases.
Wrist: Unchanged in 2 cases. More pronounced 2 cases.
Radial: Unchanged 3 cases.
Biceps: Unchanged 1 case. More pronounced 2 cases.
Knee-Jerk: Unchanged in 4 cases. More pronounced in 2 cases.
Achilles: Unchanged 2 cases. More pronounced 2 cases.
Plantar: Unchanged 2 cases.

B. I find that with weak faradic current, exaggerated reflexes change as follows:

Triceps, Wrist, Radial, Biceps: Unchanged 1 case each.
Knee-Jerk: More pronounced exaggeration in 3 cases.
Achilles: Unchanged 1 case.
One case showed leg clonus on patella tap, when without electricity both knee-jerks were merely exaggerated.

C. With weak faradic current, not enough cases were tried to tabulate any pathologic reflexes.

D. I find that with mild faradic current, absent reflexes changed as follows:

In one case of multiple neuritis, knee-jerk pronounced absent by every other method of reenforcement clearly elicited with weak faradic current and just after the current had passed.

In one case of anterior poliomyelitis (?) right Achilles pronounced absent by Dr. Thomas with usual methods of reenforcement. Found later to be absent because tired out. Obtained, however, after being tired out during the passage of a mild faradic current. Came about every other trial. Also found occasionally present after the current had passed and was again cut off. (Dr. Daly's observation.)

In one case of paresthesia of hand, knee-jerk reported absent on both sides with all other methods of reenforcement but obtained in mild faradic current on both sides. In the same case the right Achilles pronounced absent but elicited with a mild faradic current, a mild galvanic current, and a strong galvanic current.

Had there been *but one positive case*, had electricity only once elicited a reflex not obtainable by any other method of elicitation, it would have been worth reporting. But here are several.

1. Swift, Walter B.: Studies in Neurological Technique No. 1: The Points in Jendrassik's Method of Eliciting the Patella Reflex, Alienist and Neurologist, 1913, xxxiv, No. 3.
2. Swift, Walter B.: Reflex Frequency and Its Clinical Value, Jour. Nerv. and Ment. Dis., 1913, xl, No. 9.

CONCLUSIONS FROM THESE FINDINGS

From some 46 tests of the reflexes during the passage of the electric current, including normal, exaggerated, pathologic and absent reflexes, the phenomena show the following data:

1. Normal reflexes are made more active in about half the cases examined.
2. Exaggerated reflexes are unchanged in the arm, made more pronounced in the leg with exception of the Achilles.
3. Not enough pathologic reflexes were tried to warrant any conclusion.
4. Absent reflexes are generally unaffected but are sometimes elicited with this method when all other methods have failed. Applicable to the knee-jerk and Achilles.

COMMENT

That the electric current enhances the normal knee-jerk has no clinical value; also that during the current exaggerated reflexes become more exaggerated is of no great value. Whatever changes may be found in pathologic reflexes, and I predict here an increase, may contribute little. The fact of indirect value that they contribute to the situation is the general effect of electricity on general reflex action—the action of enhancing them—a fact that makes the findings under absent reflexes of more weight than if the opposite had been true. For if no increase of reflex action had been found in normal and exaggerated reflexes, we would be inclined to doubt such findings under absent reflexes, but finding they are increased in action when normal, and when exaggerated, we are still more inclined to expect that same action when the reflexes are absent by usual methods.

This finding of enhancement of them among normal and exaggerated reflexes lends momentum to the findings while the current is passing through otherwise absent reflexes.

Among absent reflexes the current occasionally elicits a reflex otherwise unobtainable. This is surely of some clinical value as a new and improved method of reflex elicitation.

Granted, many absent reflexes are pathologically absent and then no current can elicit them—as for example I have found in tabes—but there exist *borderline cases*—even cases in which absent or present may turn a diagnosis or markedly change a prognosis—and it is in these latent reflexes (that occasionally are so important to find), that this new method plays a service to neurologic routine examination in succeeding in demonstrating their elicitation.

SUMMARY AND CLINICAL VALUE

Examination of over forty cases of reflexes during and some after (Daly) the passage of the electric current demonstrates that the general effect of electricity on the reflexes is that of a reenforcement—which finds its special clinical value by elicitation of some of the absent reflexes unobtainable by any other method. I therefore claim a new method of reflex reenforcement of sufficient value to be included among other routine and neurologic examination methods in the following order: pendulum leg, diversion of mental attention, constant movement during stimulus, the Jendrassik hand-grasp, and finally, when all others fail, the electrical reenforcement.

Medical History.—Old sciences are unraveled like old stockings, by beginning at the foot.—Swift.

ABSTRACT OF DISCUSSION

DR. J. T. FISHER, Los Angeles: Dr. Swift is to be congratulated on discovering a method of eliciting a lost reflex. I would like to have him explain a little more in detail the technic of the procedure, and would ask, in addition, if we are to understand that when the knee-jerk is gone, lost forever, as we see in cases of well-advanced tabes, he can reproduce that reflex by the method which he uses, or whether he has reference merely to the lost reflex which sometimes does occur in functional cases due to overfatigue of the reflex arc by the ordinary method of taking a reflex.

DR. WILLIAM W. GRAVES, St. Louis: We need, of course, anything in clinical work which will aid in determining the functional activity of the nervous system, and among its activities, those pertaining to reflexes are of the first order. Until it is a uniform practice to guard against the pitfalls in the use of reflexes, we shall not be able to use all of the refinements in examinations. I did not understand whether it was during the attempt to elicit a given reflex—the knee-jerk, for instance—that the electric current was passed, and whether it was assumed that the stimulation served as a means of increasing the excitability of the reflex arcs, or whether the use of the current was merely a means of suddenly diverting the patient's attention. I would ask Dr. Swift to explain these points in closing.

DR. WALTER B. SWIFT, Boston: Dr. Fisher asked about the technic in eliciting the knee-jerk. I put one electrode under the leg of a sitting patient and the other one on the calf. In eliciting the Achilles tendon reflex I put one electrode on the calf and one on the sole of the foot. I find it does not make any difference which electrode is put above and which one below. Dr. Fisher also asked about the type of the reflex that I attempted to bring out. I agree with the suggestion made by Dr. Fisher that the absolute pathologically broken arc can not be revived in its function, and that the lost reflexes of tabes and other pathologic lesions when the arc, either of the motor side or of the sensory side, is entirely gone, cannot be brought out by this method. This will perhaps also answer Dr. Graves' question: It is applicable in border-line cases; that is, those in which other methods have failed to elicit a reflex, and in an arc that is intact. In cases in which our diagnosis turns more or less on the absence or presence of a reflex, and in which it is found impossible to elicit those reflexes by our usual methods of reinforcement, this is a final resort. I would not by any means propose that this should be a matter of usual routine in neurologic examinations. I think that is entirely out of the question; but I do think that it is of value in rare cases and in border-line cases when other methods of elicitation have failed, and that I have found in the clinic of the Boston City Hospital in these cases that I have reported. Dr. Graves asked about the effect of the electricity. The reflex is taken with the current on; that is, the current is started and the reflex is taken during the passage of the current. He also asked whether it was the effect of the current that elicited the reflex, or the diversion of the attention. From the fact that the reflex has also been obtained after the current has passed and after the electrodes have been removed I would be inclined to give the credit to the passage of the electricity, especially as these cases have failed to show reflexes when other methods of diversion of the attention have been employed.

The Duty of Research in the University.—Wonderful as were the isolated achievements of the great discoverers in medicine in the early centuries, the great continuous advance in medicine during the past eighty years resulted from organized laboratory effort based on the principle of exact experimental methods; and it is the duty of the university so to organize its laboratories and hospitals that this advance of medicine by research may continue, side by side with teaching, as a university function of benefit to students and faculty as well as to the state and the general public welfare, and thus as an aid to the advancement of civilization.—Richard M. Pearce.

FOUR CASES OF SUDDEN DEATH IN A SILO

E. R. HAYHURST, M.D.
Director, Division of Occupational Diseases, Ohio State Board of Health
AND
ERNEST SCOTT, M.D.
Professor of Pathology, Ohio State University, College of Medicine
COLUMBUS, OHIO

In view of the constantly increasing importance of the silo for the preservation of fodder on the American farm, it seems proper to draw widespread attention to the danger of fatal asphyxia which may occur to workers in filling and emptying silos. There are no reported cases on record of fatalities under such circumstances so far as we have been able to learn after a careful search of the literature. Agricultural bulletins[1] warn of the danger of carbon dioxid asphyxia unless certain precautions are taken. A sudden death here and there has unquestionably been laid to heart failure, apoplexy and the like.

Since the first American silo was built by Dr. Manly Miles,[2] in 1875, the principle has undergone widespread development throughout the country so that the dangers herein cited are liable to beset a large number of persons. The danger from the accumulation of heavy gases in the old type of pit-silos dug in the ground can be easily appreciated, but the instances in question took place in a modern upground metal silo, built about 40 feet high, and free from surroundings which might interfere with ventilation.

At the Athens (Ohio) State Hospital, at about 7 o'clock on the morning of Sept. 19, 1914, four members of a squad of six men ascended the ladder on the outside of the silo in question to an open door about 12 feet from the top, and jumped in, one after the other, on the silage, the level of which was about 6 feet below the doorway. Within five minutes, as reported, the next two men who ascended shouted down that the first four looked as though they were dead. A large force of workers who were at hand immediately ascended the silo, and opening a lower door which was just above the level of the silage, hurriedly removed the unconscious forms, and, in spite of the immediate arrival of four or five physicians from the institution, all attempts at resuscitation failed.

The unfortunate ones, one of whom was 31 years old, and the others 56, 56 and 67, were "trusties" at the institution, and all had been engaged for several years on the institutional farm, and had helped in filling silos for the past two or three years. During the two weeks previous they had helped to fill two large wooden silos nearby, and during the three days previous had helped with the filling of the metal silo in question. Their work was to tramp down the ensilage as it was delivered from the blowpipe. On this morning the machine had not yet begun operations, and apparently the men sat down or lay down on the silage to wait.

To expedite the removal of the victims they had to be let down head first within the 3½-foot chute which

---

1. Babcock, S. M., and Russell, H. L.: Causes Operative in the Production of Silage, 17th Ann. Rep., Wisconsin Agric. Expt. Sta., 1900, p. 131. Crisp, H. L., and Patterson, H. J.: Silos and Silage in Maryland, Bull. 129, Maryland Agric. Expt. Sta., July, 1908, p. 10. Erf, Oscar: The Silo for the Dairy, Bull. Agric. Coll., Farmers' Reading Course, Vol. 2, No. 4, Ohio State Univ., p. 3.
2. Year Book, U. S. Dept. Agric., 1899, p. 616.

surrounds the ladder. In this manner they were passed down from helper to helper to the brickpaved dairy-yard below. All were cyanotic, and respiratory movements had ceased, but it was thought that in three the heart action was still present when resuscitation efforts began. In a few minutes, however, all became pallid, and in spite of an hour's efforts on each one with artificial respiration and stimulants, none revived.

On the evening of the same day we arrived at the institution and necropsies were performed on two of the bodies with significant anatomic findings (which were exactly similar in both cases) as follows: A black fluid condition of the blood which flowed persistently from practically all places of incision, there being an entire absence of clots; marked cyanosis of the lungs and mucous membranes of the tracheae and bronchi. The same was true of the livers and kidneys. There was also marked capillary injection of the brains and intestines. Aside from these findings the tissues of the bodies showed no recent changes worthy of comment; especially there were no pathologic conditions of the hearts or vessels to be noted.

The next morning about 7 o'clock we visited the silo in question, where conditions had been allowed to remain as on the previous morning, except that before orders could be issued a couple of feet more of silage had been added. This had apparently sunk 1 foot during the night, leaving about 5 feet up to the bottom of the door in question. However, according to the manner in which the gases are generated (see below), about 10 or 12 feet should have been added, more nearly to reproduce the amount of gas to which the workmen had undoubtedly been subjected. The weather on the two days was practically unchanged, being slightly cool at night and warm during the day. The silage consisted of fresh, rather finely cut, immature corn. Light within the silo was good, owing to open doorways above and in the roof. The temperature seemed about 10 F. higher than that of the atmosphere without. A more peaceful and inviting scene could not be imagined than the warm, pleasant smelling green silage within. With a few moments to spare, the most natural thing for workmen to do would be to sit down or lie down on the silage.

We dropped a guinea-pig within, which, in thirty seconds, toppled over unconscious after a brief exhibit of respiratory difficulty. A rabbit was next dropped down on the silage. It took a few steps, showed some dyspnea and dropped over on its side unconscious at the end of sixty seconds. Next a large, slender collie dog was lowered down and in just two and three quarter minutes it likewise fell over unconscious. The oncome of unconsciousness in all cases was very sudden. The animals, after unconsciousness, rapidly turned bluish about the nose, lips, tongue (and ears in the case of the rabbit). The guinea-pig was dead in ten minutes, the rabbit at the end of forty-two minutes, while the dog was removed at the end of thirty-three minutes, when abdominal and chest movements had ceased, although drawing back of the corners of the cheeks was still present. Within a few minutes on the outside, the dog, which had been let down by its tail, showed signs of reviving; at the end of six minutes it appeared partly conscious, and thereafter rapidly recovered without any efforts at resuscitation having been tried. Necropsies on the guinea-pig and rabbit revealed conditions entirely similar to those described above in the cases of the human subjects.

Next a bunch of matches, lowered on a pitchfork tine, snuffed out at a level of about 18 inches above the silage. A lantern behaved similarly, and the level of the gas could be estimated within half an inch by means of the effect on the lantern flame. At this point a gallon bottle of water was lowered, inverted, and a sample of the gas thus collected.

Another half-mongrel dog of medium size was dropped in, but unlike the collie, which sniffed around over the surface of the silage, this dog kept its nose well elevated and showed very few symptoms. At this point one of the investigators jumped in and lowered his head to the top of the silage. A most startling, rather pungent, warm and slightly alcoholic smelling gas caused the investigator to retreat hastily to the open door above. The lower door (just above the silage) was then opened, through which the second investigator detected the same gaseous odor, which irritated the mucous membranes and the throat considerably, and the effects of which could be felt for fifteen or twenty minutes afterward. There was no odor suggestive of bitter almonds, garlic or rotten eggs (hydrocyanic acid, hydrogen arsenid, or hydrogen sulphid). A few more experiences convinced the investigators, however, that one could rapidly become used to the at first unpleasant effects of the gas, and that to workers customarily employed about silos it might not be considered of any moment.

Experiments with animals and lights were made in the two neighboring silos, which had been filled with a riper and dryer corn fodder, but all resulted negatively.

The analyses of the gases collected, which were made by Prof. William L. Evans, of the Department of Chemistry, Ohio State University, showed as follows:

A. Sample from the silo in which the deaths occurred:

Gas	First Estimate Per Cent.	Second Estimate Per Cent.
Carbon dioxid.....	38.0	38.3
Oxygen	13.5	14.0
Nitrogen	48.5	47.7

No test could be obtained for carbon monoxid, ammonia, hydrocyanic acid or methane.

B. Sample from one of the neighboring silos (filled, however, the week before):

Gas	First Estimate Per Cent.	Second Estimate Per Cent.
Carbon dioxid.....	.20	0.24
Oxygen	20.5	20.7
Nitrogen	79.39	79.06

Likewise no test could be obtained for ammonia, hydrocyanic acid or methane. (Nitrogen was determined by differences in both cases.

According to Rambousek,[3] 10 per cent. of carbon dioxid in the air causes asphyxia, which is usually sudden.

Some peculiar features obtain in silos. The initial *heating* of silage is described[4] as due to the direct respiration of plant cells, increased by the cutting of plant tissues, by intramolecular respiration of ensiled material (the chief factor), while (in a tight silo such as this was) the factor of bacterial and mold action is practically negligible.

3. Rambousek, J.: Industrial Poisoning, translated by T. M. Legge, 1913, p. 201.
4. Babcock, S. M., and Russell, H. L.: Causes Operative in the Production of Silage, p. 130.

The *composition*[4] of the air at time of filling is of course the same as the normal atmosphere, but immediately after the cut fodder is ensiled, absorption of oxygen by the plant tissues begins and continues until all of the free oxygen in the air spaces is consumed by the respiratory processes of the plant. This direct absorption of oxygen is nearly, but not quite, counterbalanced by the evolution of carbon dioxid, as a portion of the oxygen combines to form other by-products. An analysis of the air even within twenty-four hours often shows no free oxygen. The nitrogen of the air is unaffected by these plant processes.

Within a short time gas begins to be given off, and continues at an increasing rate for a day or so, then gradually diminishes. The gas so evolved is largely CO_2, but is mixed with the residual nitrogen of the contained air. This CO_2 is the result of intramolecular rather than direct respiratory processes, and as the oxygen required for this change is derived from the tissues of the plant, the volume of gas in the silo is increased by the amount of CO_2 formed. The evolved CO_2 is therefore a measure of the intramolecular respiration. The evolution of this gas marks an actual and unavoidable loss in the organic matter of silage. This source is operative so long as life exists in the plant cells, but when the cells die, gas from this source is no longer given off. . . .

When the gases of a silo are measured, either by volume or by absorption of the CO_2, the production of gas is found to be very rapid for the first few days, and then to diminish quickly in a manner somewhat comparable to the evolution of heat previously referred to. It soon reaches (two weeks or so) a rate that continues with slight fluctuations for some months. Such a rate of gas evolution can only be intelligently interpreted by assuming that most, at least, of the CO_2 evolved is the result of processes inherent to the plant cell, and not to fermentative action set up by organisms which must have developed subsequent to the ensiling of the fodder.

In fact, it is the presence[5] of this carbon dioxid gas which is the principal perserving agent in the silage. The escape of this gas from the silo will immediately start decay. Usually mold does not affect more than the mere surface of the silage and this acts as a seal to prevent the air from decaying the silage to a greater depth. The amount of carbon dioxid developed[6] in a silo filled with immature corn may reach 75 per cent. of the total gases present, the chief remaining gas being the nitrogen of the air.

"The conditions favorable for a maximum evolution of carbon dioxid is an immature corn cut into fine pieces and placed in the silo at intervals"[7] (as the daily filling with nightly interruptions).

Fatal asphyxia from carbon dioxid has been reported under the following somewhat similar conditions: among vintners, distillers, brewers, yeast makers, in the holds of grain vessels and in peat pits. But a very great danger exists also in every silo unless precautions are taken. These consist in keeping the doors immediately above the level of the silage open, or in having unhinged doors which fall in as the silage settles below them, while the absence of a roof (which is said not to be necessary) would permit prevailing winds to draw off gases by suction action. The gas can be driven out easily by using an open umbrella, bunch of hay, or leafy branch of a tree to promote diffusion. When any doubt exists, the effects on a lantern flame should be noted.

In case of accident, the Meltzer apparatus, recommended by the Committee on Resuscitation from Mine Gases,[8] would appear to be the best of the mechanical devices available.[9]

We desire to thank Dr. O. O. Fordyce, superintendent of the Athens State Hospital, his staff, and others for their kindly efforts in facilitating investigations. A complete report of this investigation including necropsy findings will be given in the *Monthly Bulletin* of the Ohio State Board of Health for October, 1914.

5. Erf, Oscar: The Silo for the Dairy, pp. 13 and 27.
6. King, F. H.: Influence of Close Packing of Corn in the Silo, etc., 18th Ann. Rep., Wisconsin Agric. Sta., 1901, p. 202.
7. Quoted from letter under date of Sept. 30, 1914, from R. H. Shaw, chemist, Bureau of Animal Husbandry, Dairy Division, Washington, D. C.
8. Technical Paper No. 77, U. S. Bureau of Mines, August, 1914.
9. Resuscitation from Mine Gases, editorial, THE JOURNAL A. M. A., Sept. 26, 1914, p. 1117.

KALA-AZAR

A CASE REPORT FROM CHINA

ALFRED C. REED, M.D.
CHANGSHA, CHINA

The economic significance and pathologic and clinical course of kala-azar have been studied and described by many observers in Africa, India and the Mediterranean littoral. Its recognition in China, however, is of comparatively recent date, and data are yet insufficient to estimate its economic significance there. It is safe to assume that the disease will be found as serious a problem in China as in other countries where it is endemic. For the present it is most essential that complete and reliable data be secured on the question of prevalence and distribution of kala-azar in China. As the infective agent of the disease is known, and as it is transmitted by bedbugs, rats and perhaps other vermin, and finally as the endemic section of China corresponds in latitude and somewhat in climate to a considerable part of the United States, studies of kala-azar in China may prove to have a direct value in sanitary and quarantine administration of the United States in the future. It is not the purpose of this report to review the clinical or natural history of kala-azar, or to present descriptions which are easily accessible in standard texts. It is desired to report one case outside the endemic zone established for China by Cochran, and to call attention to a disease which in the future may be of practical as well as of academic interest to American physicians.

After as complete a survey as could be made, Cochran[1] mapped out as the endemic area for China the section bounded on the south by the Yangtze River, and including that part of the provinces of Kiangsu, Anhwei and Hupeh lying north of the river, the eastern half of Hupeh and Honan, the southern half of Chihli including Peking, and all of Shantung. Reference to a map will show the relation of this area in latitude to the United States. A considerable similarity also exists in the matter of climate. Outside of the area indicated, Cochran obtained but two positive reports, from Wuchang and Kiukiang, respectively, which are on the south bank of the Yangtze.

The present case is reported from Changsha, the capital of Hunan, 200 miles south and west from Hankow and Wuchang, on the Siang River, which is a tributary of the Yangtze.

The patient, an unmarried Chinese man of 28 years, was admitted to the medical service of the Red Cross Hospital, Feb. 26, 1914, where he remained until his death, April 20, 1914. He was a boatman by trade, a native of Yuen Kiang on the upper Yangtze River near Ichang. He came to Changsha less than a year before his admission to the hospital. His father, an opium addict, died of dysentery at the

1. Cochran: Jour. London School Trop. Med., 1912, ii, Part 3, p. 179.

age of 42. His mother survived him. Of four brothers all were living and well. Two years before, one of his fellow boatmen developed a disease similar to his own and later a second boatman died with symptoms such as the patient presented on admission.

Except for measles in childhood, the patient was always in excellent health previous to the onset of the condition for which he sought hospital relief. This illness began five years before with severe abdominal pain, diarrhea and blood-streaked stools. The condition had persisted with periods of exacerbation and amelioration. His complaints on admission were anasarca, most marked in the peritoneum, shortness of breath and general debility. Physical examination showed a young man of medium height, very emaciated, markedly icteric, with a dry, elastic, hot skin. There were extreme abdominal distention and umbilical protrusion. The icterus was notably greenish and of universal distribution. The pulse was 100, soft, weak and regular. The fingers were somewhat clubbed and cyanosed, and the capillary circulation was poor. The conjunctivae were greenish-yellow.

The mouth and throat were normal. The deep cervical, axillary, inguinal and epitrochlear glands were easily palpable and of moderate hardness. The neck was severely emaciated and a venous pulse was observed in both external jugulars. In the lungs the left apex was dull, with high-pitched respiration, prolonged expiration, increased vocal fremitus, and crepitant râles. The right apex showed slight dulness, high-pitched respiration, prolonged expiration and crepitant râles after coughing. Elsewhere in the lungs the respiration inclined to the bronchial type. Breath-sounds were lost anteriorly and posteriorly at the level of the sixth rib. Below this point posteriorly there was flatness with deep tympany on heavy percussion.

The apex-beat was visible in the third left interspace, 3½ inches from the median line. In character it was heaving and diffuse. Palpation corroborated the location. A blowing, rather harsh systolic murmur was heard at the apex and transmitted to the axilla. A very harsh systolic murmur was heard also at the aortic and pulmonary areas. The valvular and muscular quality was fairly good.

The abdomen was enormously distended, tympanitic between the lineae semilunares, and flat outside these lines. The spleen was enlarged a hand's breadth below the costal margin. The liver was not enlarged. The lower extremities, especially the feet, were very edematous. Reflexes were normal.

The sexual organs showed a peculiar hermaphroditic arrangement, which is worthy of report, although it had no bearing on the disease in question. The penis was infantile, more resembling a hypertrophied clitoris. The urethra was patent to the extremity of the penis, but there was present also a hypospadias with a comparatively small aperture at the bulbous portion of the urethra. Urination took place both through the hypospadiac aperture and through the penile urethra, sometimes concurrently, sometimes interchangeably. A rudimentary vaginal pouch was present, with well-marked labia majora, rudimentary labia minora and with its floor slightly deeper than the normal location of the hymen. The testicles were small, soft, and retracted into the inguinal canals, from which they could be drawn down into the labia majora. The inability at the time the patient died to secure a necropsy prevented examination of the internal structure and histologic examination of the testicles. The pubic hair was not abundant and covered a triangular area. No hair was on the face or in the axillae. The mammae were typically masculine. The expression, voice and general demeanor were feminine.

Death occurred in toxemic coma after an illness of five years and after two months in the hospital. The icterus steadily increased and during the last month the splenic tumor enlarged and became markedly tender. At no time was hepatic enlargement observed. The ascites, icterus and lack of hepatic hypertrophy indicated rather a considerable degree of cirrhotic contraction. The temperature remained fairly normal with an occasional rise to 38 degrees. The pulse ranged between 70 and 90, and the respiration from 20 to 25.

Clinical laboratory reports were as follows: Examination of feces on admission showed a whitish semisolid specimen, with no mucus or blood. *Ankylostoma* ova were present. Subsequent examinations were the same with the addition at times of a small amount of blood. Except for an occasional trace of albumin, the urine was normal. Blood examination, March 10, six weeks before death, showed 3,800,000 red cells, 70 per cent. hemoglobin, (color index 0.94), white blood-cells 3,200. The ratio of white to red cells was 1:1,187. Smears stained by the Leishman modification of the Romanowski method, out of 200 cells counted, gave a differential white cell-count of polymorphonuclears 60 per cent., large lymphocytes 15 per cent., small lymphocytes 10 per cent., eosinophils 1 per cent., mononuclear and transitional forms 14 per cent. The stained red blood-cells were somewhat pale, and included many poikilocytes, macrocytes and microcytes. The *Leishmania donovani* was found, two in one leukocyte. A blood examination one month before death showed a further reduction of red cells to 2,300,000, hemoglobin 70 per cent., white cells 3,000. The differential count was unchanged. The red cells, however, showed a progressive anemia, having more macrocytes and microcytes, numerous poikilocytes and many normoblasts, as well as irregular staining and granular degeneration.

According to the method recommended by Cochran, superficial lymph-nodes were twice excised from the inguinal regions under local anesthesia, and smears from them examined for *Leishmania*. In both cases numerous suspicious and atypical bodies were found in the lymph-cells, but no clear-cut, positive picture was obtained. This is perhaps to be explained by the advanced stage which the disease had attained.

Treatment was symptomatic throughout, except that the *Ankylostoma* was eliminated with thymol. The peritoneum was tapped three times and 10,300, 10,000 and 10,500 c.c. of ascitic fluid, respectively, were withdrawn. Death occurred after thirty-six hours of delirium and coma, with extreme jaundice and myocardial failure.

The diagnosis of kala-azar in this case is based on the finding of two of the *Leishmania donovani* in a leukocyte of the peripheral blood, and is supported by the occurrence of numerous atypical bodies in lymphatic gland-cells obtained a few weeks before death, by the clinical history and appearance of the patient, by the blood-picture and by the elimination of other possible causative agents for the disease. The duration of the disease, the patient's age, and his knowledge of other similar cases are in correspondence to the diagnosis. It is to be noted that this case originated near Ichang on the Upper Yangtze River, and reached its development at Changsha, both points well out of the area which has to date been considered endemic for China. The pulmonary lesions represented an intercurrent affection due essentially to the patient's chronic illness with its depleting and exsanguinating course.

As already mentioned, kala-azar is found to flourish in China in an area corresponding in latitude and to a great degree in climate with a considerable portion of the United States. As the disease is carried by bedbugs and perhaps other vermin, its introduction into the United States might at any time prove serious, and its spread might be rapid. Suspicious cases are easily recognized clinically by the splenic tumor and blood-picture, and all such cases should be examined for the presence of the *Leishmania* on which valid diagnosis rests.

The Changsha Yale Hospital.

Caution.—For truth itself has not the privilege to be spoken at all times and in all sorts.—Montaigne.

THE HISTORY OF THE FIRST MILK DEPOT OR GOUTTES DE LAIT WITH CONSULTATIONS IN AMERICA*

HENRY KOPLIK, M.D.
NEW YORK

When I returned from my studies abroad in 1887 I was appointed attending physician to the Good Samaritan Dispensary, New York City. I had control of the service in diseases of children, and at this time there was an undercurrent of feeling that the treatment of children in dispensaries needed the introduction of new ideas as compared to what was then in vogue. In all dispensaries or outdoor clinics in children, then as now, the mass of cases have among them as a large quotient the disorders of the gastro-intestinal tract. It was customary then, as often now, to treat these cases in a most routine manner. The infant was prescribed some mixture, and the mother sent away with some instructions and allowed to find the best way she could of carrying out the directions given her. She might remember some and forget others which were of vital importance. It mattered very little. I felt that this was entirely unsatisfactory. As we believed, then as now, that the food of an infant was of first moment in its recovery, I determined to place the food at the disposal of the infant, leaving the administration of drugs to take a secondary place. With this idea in view there arose in 1889, the first milk depot or *gouttes de lait* in my dispensary. At first I put the milk up in separate bottles and sterilized it. The apparatus was exceedingly simple. After sterilization the milk was placed in the keeping of the apothecary of the dispensary, then the Eastern Dispensary, and was given to the patients only on prescription. The sick infant was first seen by me, and then the mother received her directions and milk, and was told how to use it—to give it whole or to dilute it with barley gruel in definite proportions. After having given this to the mother she was directed to bring the infant at regular intervals; it was weighed, watched and treated. This simple innovation seemed to create quite a stir among the mothers, and met with ridicule and opposition from the unthinking. The results, however, began to attract attention. The sterilized milk in separate bottles, each bottle to be given at certain intervals to the child, was looked on by my mother-patients as something short of marvelous. The mothers and babies flocked to my dispensary. In addition physicians came to watch the effect and the manner of this innovation in the treatment of gastro-intestinal disorders of infancy. So successful was this departure that in May, 1890, I was persuaded to show my methods and apparatus, and describe my milk depot, then a year in existence, before the New York County Medical Society. I remember well the rather distant and patronizing attitude of my audience. A well-known pediatrist at this meeting remarked that the milk depot could never become popular on account of the labor of washing the bottles; and therefore it must perforce be very limited in its application. I persevered, however, and Nov. 12, 1890, I made a communication[1] to the New York Academy of Medicine, Pediatric Section, of my work in establishing my idea of milk depots or dispensaries for the feeding and treatment of infant intestinal disorders. In this paper I pointed out that medical supervision must go hand in hand with the administration of milk and food. The milk which I utilized was the best I could obtain at the time, and being without means to supply milk from my own farm, and certified milk being unavailable, I went into the open market and bought the best bottled milk, sterilized it in separate portions, and thus did the very best I could for my patients. This work was not without results. I felt that the patients who came to be treated were so troubled and often so ignorant that the milk must be placed in their hands ready for the infant, and all they would have to do was to give it at proper intervals. Thus the first milk depot, *gouttes de lait*, in connection with medical advice (consultations) became an established fact in America. When the old Eastern Dispensary moved into new quarters and assumed the name of the Good Samaritan Dispensary, a lay committee furnished funds to enable me to extend the field of usefulness of this new idea of milk depots. I then devised new apparatus, and in a short time, with a large staff of helpers, we were enabled to extend our work materially, and feed large numbers, sometimes two hundred infants daily, with milk put up in formulas in separate nursing-portions. This was in 1891. The facilities of thus treating infants with intestinal disturbances was not limited to dispensary patients, but physicians were invited to send to the milk depot and have certain formulas prepared for their patients. During all this time the campaign to further this method of caring for sick and well infants received most decided opposition, as every new departure will, and also great encouragement. Infants in my service were weighed, watched, and fed; those from other physicians were not controlled. Thus the first milk depot, *gouttes de lait*, with medical control became the topic of interest in all quarters, and even the daily press found something of interest in this new departure.

At first the milk, as I have indicated, was given whole, sterilized, to the patients, and the patients directed to dilute it according to directions. It was soon found that this was not enough. The patients must have the finished formulas put into their hands ready to give to the infant. They could not be trusted to dilute it correctly. The milk became contaminated or spoiled in the handling of it. It was then decided to give each infant a definite formula and quantity according to its age, and thus each child was studied as to the best method of feeding. In a milk depot only a few formulas could be put up which would apply to the largest number of infants as an average application. Thus for the infant from birth to the third month the Meiggs formula was prepared. As is well known, the Meiggs formula contains 1 per cent. protein, 3 per cent. fat, and 6 per cent. milk sugar approximately. For infants older, from the third to the eighth month, the so-called Heubner-Soxhlet mixture was advised, and in addition whole milk in the sterilized or pasteurized state was furnished to mothers. All the apparatus, including that for sterilizing or pasteurizing the milk, the device for cleansing the bottles, and those for refilling, were of my own models. The great principle followed was not merely that our milk depot be regarded as a place where milk was sold, but where a carefully conducted daily clinic took care of the sick or even well infants, treated them individually, and gave each infant the

* Read before the Association of Milk Commissions, Rochester, N. Y., June 19, 1914.

1. Koplik, Henry: The Administration of Sterilized Milk in Dispensaries, New York Med. Jour., Jan. 31, 1891.

food fitted for it. Infants were all systematically weighed once or more a week, and the Good Samaritan depot became the Mecca of mothers with sick babies, and of physicians who were interested in the advanced treatment of gastro-intestinal disorders and the feeding of sick and well infants and children. In the New York Medical Journal of Feb. 4, 1893, I described[2] the first two years' work of the milk depot under the enlarged and perfected plan. I there stated the origin of my milk depot idea in 1889 and its development. I had found as a matter of interest that the old form of sterilization at 100 C. was not as desirable as would be a lower degree of sterilization, and it was shown that in a public milk depot heating of the milk at from 65 to 68 or 70 C. was too low, as careless handling by the mothers soon allowed the milk to sour in twenty-four hours, whereas 85 to 90 C. was sufficiently high to trust them with the milk in the heated term, and the milk would keep quite well in a moderately cool place for twenty-four hours. In the previously mentioned article I also published the work of 1891 and 1892 with the improved facilities and new buildings of the former Eastern Dispensary, now the Good Samaritan. At that time "certified" milk was not generally obtainable so I obtained the best milk in the open market in cans or bottles, a much better milk than was accessible to my patients. The work done in this milk depot during the years 1891 and 1892 was as follows:

Separate nursing-portions	101,482
Infants and children supplied	1,274

Inasmuch as these children all passed under my direct daily supervision and treatment it can be surmised that the work done was little short of herculean. In this article I calculated that the number of children who received the control of food and advice, for any length of time, was 539, for the two years. The following figures show the work done in the first year of the existence of the milk depot of the Good Samaritan Dispensary. It is still in existence, feeding, on an average, 130 children daily.

RECORD OF FIRST TEN YEARS' WORK OF MILK DEPOT OF GOOD SAMARITAN DISPENSARY*

Year	Bottles Supplied	Children Supplied
1889	7,000	137
1891	44,111	574
1892	57,371	700
1893	70,068	976
1894	70,705	720
1895	75,550	932
1896	96,313	766
1897	155,989	1,064
1898	298,674	1,204
	875,781	7,073

* Records for 1890 lost.

In the first work on milk and its relation to public health, from the United States Hygienic Laboratories, this work escaped notice, but in a subsequent revision by Dr. J. W. Kerr of Washington, I had the satisfaction to see the work of this pioneer character mentioned.

I can say thus that the original idea of putting into operation the milk depot in direct connection with dispensary treatment originated in the United States, in the Eastern Dispensary, in the children's service of which I was chief, and was perfected in the present form in which it still exists in the Good Samaritan Dispensary, as I have shown. I remember well my insistence to students who visited my clinic and milk depot and laboratory that all feeding of babies from milk depots should be under direct medical control. I had occasion also to show later the harm done by giving patients, or selling them, milk without physicians' prescriptions. When some four years after the depot was started by me in my service, other milk depots arose in the effort to supply the poor with good milk, I found that some of my patients after exhausting the supply obtained in my clinic, would go elsewhere, and buy, without control, additional feedings. Such children would, of course, become very ill from excess of food. This could not happen were the depots under strict medical control. The good intended was in many cases thus overshadowed by the harm done. In any clinic for the treatment of infants and the feeding of the well and sick infants, there will always be a floating quantum of patients who drop out, but a certain percentage, as indicated, remain, especially if mothers see that the medical care is sincere, that the infant is watched and weighed. At this time when complicated mixtures were prescribed I would, if I thought the mother was earnest, send a nurse to the house, especially if the mother could not spare time from her work, to teach her the making of the food and the details of care of the infant. I feel now, as I felt and agitated at this time, that the milk depot alone is of very limited utility if not combined with actual, not nominal, medical treatment of the infant. To-day we have also this idea of quite general adoption in foreign countries and America. The milk depot with actual medical supervision of infants has come to be generally adopted, and will in time attain greater perfection of method, and will reach more infants as mothers become more educated in the care of their infants. The ideal method is that which I have first adopted and practiced. The physician first sees the infant, if the baby is well, and at the breast, the breast-nursing and addition of bottle-feeding is advised, if the breast is not sufficient. If the breast is not available after an examination of the mother then artificial feeding is given. If the infant is ill, it is first treated for the illness. An illness not involving the gastro-intestinal tract is rather aided to recovery by feeding properly. If the gastro-intestinal tract is involved, the physician first carefully guides the infant through severe illness to the proper food. This is the method, it seems to me, which should be introduced in all clinics. The first result of furnishing the proper food for the infants is to relieve the mother of an amount of time-consuming work, the next is to insure to the infants with mothers not so intelligent the proper food. The ultimate results show in decided reduction of morbidity if not mortality.

2. Koplik, Henry: The Sterilization of Milk at Low Temperatures and the Equipment of Milk Laboratories for Infant Feeding, New York Med. Jour., Feb. 4, 1893.

Adaptation to Environment.—Surely that much-abused philosopher, Lamarck, was not far from the truth when he said, "The production of a new organ in an animal body results from a new requirement which continues to make itself felt, and from a new movement which this requirement begets and maintains." Is not this merely another way of saying that the individual makes adaptive responses to environmental stimuli? Where so many people fall foul of Lamarck is with regard to his belief in the inheritance of acquired characters. But in speaking of acquired characters Lamarck did not refer to such modifications as mutilations; he was obviously talking of the gradual self-adjustment of the organism to its environment.—Arthur Dendy, *Medical Journal of Australia.*

END-RESULTS FOLLOWING THE YANKAUER OPERATION ON THE EUSTACHIAN TUBE *

JOHN L. LOUGEE, M.D.
Surgeon to the Otolaryngological Department of the Carney Hospital; Clinical Assistant to the Massachusetts Charitable Eye and Ear Infirmary
BOSTON

In 1910, Dr. Yankauer published a report of twenty-one cases in which the bony end of the eustachian tube had been curetted for the purpose of shutting off infection from the nasopharynx and thereby curing chronic suppuration of the middle ear. According to Dr. Yankauer, middle-ear structures were removed in only two cases. Polypoid tissue was removed only when it became necessary to allow room for operation.

Most of the patients were using drops or powder at the time of operation and were allowed to continue. Syringing the middle ear was also a part of the postoperative treatment. Granulations were touched with silver nitrate.

The average time required for healing was six months. Sixty per cent. of the patients were cured. No mention, however, was made as to the condition of the tube at the final examination of the patients.

In a later paper, read before the Otological Congress in 1912, Dr. Yankauer emphasized the necessity of treating pathologic conditions of the nose and throat, before a suppurative process of the middle ear could be cured. He also advised the removal of sloughing ossicles and polypi.

The following is a report of twenty-five cases in which the Yankauer operation was performed at the Massachusetts Charitable Eye and Ear Infirmary, during 1913, by courtesy of Drs. Crockett and Mosher.

The duration of discharge has ranged from two to thirty-five years, with an average of sixteen years. The Roentgen ray has shown nearly all of the mastoids sclerosed, the sclerosis varying in degree from a slight density to complete obliteration of the cells. Transillumination, with Dr. Mosher's transilluminator, showed little light passing through the mastoid.

All the patients were given a hearing test before operation. Most of them were suffering from some pathologic condition of the nose or throat, from which the ear trouble undoubtedly had its origin.

The operation consisted of denuding the bony eustachian tube as far as the isthmus. The ossicles were not removed, granulations were not disturbed, and no medication whatever was used. Postoperative treatment consisted in wiping the ear dry several times a day. Three patients complained of dizziness following the operation, one of whom was admitted to the hospital, and remained in bed about two weeks. Dizziness gradually disappeared.

The radical mastoid operation has been performed on four of the patients since the tube was curetted. Two of these had a very foul discharge containing flakes of cholesteatoma, with no apparent improvement from operation. The other two developed symptoms of acute mastoiditis about two months after curetting the tube. The mastoid operation disclosed a large antrum containing cholesterin and pus.

In three of the cases, the tube was curetted a second time, and the remaining ossicles and outer attic wall were removed. In two cases the nasal septum was straightened and the nasopharynx curetted.

Ten months have elapsed since the first operation, and about seven since the last, with an average of about eight and one-half months.

Many of the tubes have opened and closed several times since operation. Several cases in which the ear has been perfectly dry, at least once since operation, now show a profuse discharge.

Bands of adhesions extending from the anterior portion of the tympanic ring to the promontory were noted in three patients. In most cases the granulations showed a tendency to shrink down as the ear became dry, although the tube remained open.

A second hearing test was made on eleven patients. Five showed slight improvement in air conduction. The patient showing the most marked improvement increased from 8/35 to 2/25 voice sounds, and from 128 to 64 fork. There was no improvement in the remaining patients tested.

Recent examination of the above cases discloses the following condition:

Tubes open with granulations and discharge	11 cases
Tubes closed with ear discharging	1 case
Tubes open with ears dry	8 cases
Tubes closed with ears dry	1 case

Out of the twenty-five cases, in but one has the tube remained permanently closed with ear dry.

Of the tubes reported open with ears dry, three have been curetted a second time, and in two other cases the nasal septum has been straightened and adenoid tissue removed.

A certain percentage of chronic mastoids with cholesteatoma will eventually require a radical operation to bring about a cure. In this type of case curettage of the tube may, as a result of the reaction in the middle ear, cause an acute mastoiditis, as in the two cases noted above.

After eliminating cases of chronic suppuration, in which the radical operation is necessary, we have remaining a class of cases in which the former treatment has been the removal of sloughing ossicles and polypi, together with the correction of pathologic conditions of the nose and throat.

Does curettage of the eustachian tube add anything to this treatment? In my experience it is of very little value.

I do not believe that it is possible to close the eustachian tube permanently.

535 Beacon Street.

ABSTRACT OF DISCUSSION

DR. HARRIS P. MOSHER, Boston: When Dr. Yankauer brought out his work, it seemed revolutionary to me and I could hardly believe it in all respects true. Very soon he modified his procedure. Dr. Lougee has taken the trouble in twenty-five cases to follow out Yankauer's procedure as given in his successive papers, and his conclusions, as you see, are just the opposite to those of Dr. Yankauer. Out of twenty-five cases he has had only one good result. In most cases I do not know whether we should attempt to close the tube or to regard the closure as not necessary and not attempt it. I rather feel now that the tube should be disregarded and attention paid entirely to the middle ear.

DR. G. W. MACKENZIE, Philadelphia: I favor the Yankauer operation in selected cases. I am afraid our failures are too often due to their improper selection. Dr. Yankauer's operation is particularly fitted to those cases in which we have done a radical operation for chronic middle-ear suppuration

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

and we feel sure that the spaces in and behind the attic are clear but the discharge persists with a patent tube. My results in about two-thirds of the cases have been very satisfactory, though in some the tube remained patulous. One criticism of Dr. Lougee might be offered concerning the cases in which on operation he found cholesteatoma. They should not be accepted as fair tests. To determine the presence of cholesteatoma by examining with the microscope for cholesterin crystals is very simple. Before we criticize the operation too severely, let us not forget that we want to find out whether or not the operation is really indicated. When the attic or mastoid is involved, of course the Yankauer operation is not indicated, but, in those cases in which we can exclude these regions and limit the pathologic process to the tube, the Yankauer operation will give good results, and, furthermore, if done thoroughly and effectually, it must succeed, for the single source of infection has been eliminated.

DR. JOHN L. LOUGEE, Boston: With regard to Dr. MacKenzie's remarks concerning the selection of cases, I admit that I did not examine the secretions microscopically for cholesteatoma. It would be difficult to select the cases that would be proper for operation. The time of duration of the discharge varied from two to thirty-five years. It is very hard to tell what is going on in the mastoid, even with the aid of the Roentgen ray. I think closing the tube temporarily may be a means of setting up a mastoiditiis by shutting off drainage.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

ANTIMENINGOCOCCUS SERUM (See N. N. R., 1914, p. 239).

Lederle Antitoxin Laboratories, New York City (Schieffelin & Co., New York).

Antimeningococcus Serum (Antimeningitis Serum).—Marketed in one aseptic glass cylinder containing 30 Cc. with special sterile needle and stylet. Also in one 20 Cc. vial.

Dose.—Usually from 5 to 15 Cc. for infants and children and 30 Cc. or more for adults are given at each dose, which should be repeated at twenty-four hour intervals. The treatment of one case usually requires 120 Cc. or more.

GONOCOCCUS VACCINE (See N. N. R., 1914, p. 250).

Greeley Laboratories, Inc., Boston.

Gonococcus Vaccine.—Marketed in packages of six syringes each containing 500 million bacteria.

Lederle Antitoxin Laboratories, New York City (Schieffelin & Co., New York).

Gonococcus Vaccine, Polyvalent.—Marketed in separate syringe packages containing respectively 50, 100, 200, 400 and 1,200 million killed bacteria.

PNEUMOCOCCUS VACCINE (See N. N. R., 1914, p. 253).

Greeley Laboratories, Inc., Boston.

Pneumococcus Vaccine.—Marketed in packages of six syringes each containing 500 million bacteria.

STAPHYLOCOCCUS VACCINES (See N. N. R., 1914, p. 254).

Greeley Laboratories, Inc., Boston.

Staphylococcus Albus Vaccine.—Marketed in packages of six syringes each containing 1,000 million bacteria.

Staphylococcus Aureus Vaccine.—Marketed in packages of six syringes each containing 1,000 million bacteria.

STREPTOCOCCUS VACCINE (See N. N. R., 1914, p. 257).

The Abbott Laboratories, Chicago (The Abbott Alkaloidal Co., Chicago).

Strepto-Bacterin (Human) Polyvalent.—Marketed in packages of six ampules each containing 100 million killed bacteria; also in packages of six ampules each containing 200 million killed bacteria.

Greeley Laboratories, Inc., Boston.

Streptococcus Vaccine.—Marketed in packages of six syringes each containing 500 million bacteria.

Lederle Antitoxin Laboratories, New York City (Schieffelin & Co., New York).

Scarlet Fever Treatment.—Marketed in packages of four vials containing respectively 50, 100, 200 and 400 million killed bacteria.

TYPHOID VACCINE (See N. N. R., 1914, p. 259).

Greeley Laboratories, Inc., Boston.

Typhoid Bacillus Vaccine.—Marketed in packages of six syringes, each containing 1,000 million bacteria; also in packages of six syringes containing respectively 100, 200, 400, 600, 800 and 1,000 million bacteria.

Therapeutics

PREVENTION IS GREATER THAN CURE

(*Continued from page 1479*)

VI

VACCINATION AGAINST TYPHOID FEVER

The importance of the prevention of this disease is self-evident when it is stated that about 500,000 people are attacked by it and more than 35,000 deaths occur from it annually. Of these about 150,000 cases occur and about 25,000 die of it annually in the United States. The economic loss from expenses due to illness and to the loss of productive lives is simply enormous, and is stated by economists to represent, in the United States alone, a financial loss of about 300 million dollars a year.

The usual mortality of typhoid fever is about 10 per cent., while the protection from the recurrence of typhoid, the patient having once survived it, is represented by more than 95 per cent.; that is, less than 5 per cent. of persons attacked have a recurrence.

The most frequent cause of typhoid fever is infected water and infected milk. Washing uncooked vegetables and fruit with infected water may also more or less frequently cause the disease. As long ago as 1894 it was shown that oysters could become contaminated with water which received infected sewage, and when served uncooked could cause typhoid fever. The culpability of oysters under such conditions has been shown frequently, although some bacteriologic investigations indicate that the pathogenic bacteria from the human intestinal canal are rarely found in oysters. It has been demonstrated beyond controversy, however, that oysters fattened in fresh-water polluted streams may harbor pathogenic germs and, when served uncooked, transmit them to the human being. As it has been shown that oysters do not feed much in cold weather, the danger from their contamination in the cold months is less than in the warm months. Also, the danger of oysters becoming infected has been diminished by the decree by most boards of health that oysters must not be deposited in fresh water for fattening or in water near the shore that readily becomes contaminated with sewage.

For a long time it was not satisfactorily proved that round clams could become infected with typhoid bacilli. Hence the "little necks" have long been eaten raw by those who refused to eat raw oysters. It has been shown lately, however, that round clams may be suspiciously contaminated with sewage germs, although no positive decision that cases of typhoid have emanated from eating such raw clams is known. Long, soft-shelled clams are almost invariably eaten cooked, hence the danger of contamination from such shellfish is at a minimum.

Another source of danger from typhoid fever is that due to flies. These may carry on their feet typhoid as well as other germs and deposit them on foodstuffs in markets, in kitchens, and on the dining table. Consequently, flies are a serious menace to the health of a community. Possibly the greatest number of cases of typhoid fever occur in the early fall months because this is directly after the greatest fly period. Ninety-five per cent. of flies are born in manure heaps; therefore the most important method of exterminating the fly pest is to prevent their growth in manure heaps. The United States Department of Agriculture, in *Bulletin 118* states that a small amount of borax sprinkled daily on horse manure will prevent flies from breeding.

Borax should also be sprinkled over garbage (especially when not intended for feeding to pigs), over all refuse heaps and open toilets, and it may be sprinkled on the floors of markets. While borax will not kill the grown fly, it will prevent fly eggs from hatching. The cost of borax in Washington is between 5 and 6 cents per pound in 100 pound lots, and it is estimated that it would cost only 1 cent a day per horse for the borax treatment of stables.

Contaminated dust may infect food, and may occasionally be a cause of this disease.

Although the germ of typhoid fever always emanates from the discharges of persons sick with the disease, the danger from carriers who may for years continue to produce the living germs must never be forgotten. Therefore, every sewage system and every privy vault is open to suspicion. The water at seashores, or even fresh water not protected from contamination, should not be swallowed or taken into the mouth by bathers. Sanitary privies should be rapidly introduced, and when this is not immediately possible, means of killing the germs in human fecal matter should be constantly used. All toilets and privies should be screened from flies, and any stable or barn where milk is handled should be under suspicion if the place is dirty, dusty, and fly-infested. All foods should be under suspicion if exposed to dust and flies. The purification of water-supplies is a question for state and municipal boards of health, and failure on their part to supply to all communities pure, clean water is open to the criticism of negligence and incompetency. Great improvement, however, is being made in many communities in these respects.

In 1893, Fränkel first published his observations on the inoculation treatment of typhoid fever. In 1896, Wright published his first article on antityphoid inoculation. The British first introduced inoculation in the Indian army for the prevention of typhoid fever and demonstrated that the individual was protected by such inoculation for two and one-half years, and partially immunized for five years. In 1900, inoculation prevention was used by Germany, also, in her armies, and German and English military camps soon became almost free from typhoid fever by such protective vaccination.

The danger to an army from typhoid fever, especially during war times, when it is encamped in regions not previously equipped to care for large numbers of men in a sanitary manner, is well shown by the statement that one-fifth of the soldiers in a national encampment of our men in the Spanish-American war had typhoid fever, the actual figures being that out of 107,973 men, 20,728 had typhoid fever, of which number 1,580 died. It is also stated that in 90 per cent. of the volunteer regiments the disease broke out within eight weeks after going into camp.

In spite of all sanitary measures possible, typhoid fever will prevail until the preventive vaccination is inaugurated. With the inauguration of this measure in the United States Army typhoid fever became greatly diminished in frequency. Vaccination of our army was begun in 1909, and, in 1911, among 80,000 men only 11 cases of typhoid fever occurred, with one death. In 1912 there were 15 cases in the army, with 2 deaths. This shows that occasionally the typhoid inoculation does not protect, but the improvement shown by the diminution in the number of typhoid cases from 9.43 cases out of every thousand soldiers in 1901, to 0.26 for every thousand soldiers, in 1912, compels belief in its efficiency. The death-rate from this disease decreased, per thousand soldiers from 0.64 in 1901 to 0.03 in 1912.[1]

The incubation period of typhoid fever is about two weeks. Its duration, when there are no relapses, is about two months. This means two weeks of incubation, four weeks of more or less serious illness, and two weeks before the real convalescence. Young adults and youth are most likely to contract this disease, although it may occur at any age. This is the age, then, for the greatest effort to be made to give protective inoculations. All nurses and members of hospital staffs; students of colleges and seminaries; employees, and those who are interned in work houses, jails, prisons and asylums; men in lumber camps; and all those who travel and are therefore subjected to varying water, milk and food-supplies, such as "traveling" men, engineers, seamen, tourists, and vacationists, should receive typhoid preventive vaccination.

While it has been asserted that immunity is more positively conferred for a long period by vaccination with living bacteria (protection being similar to that produced by an attack of typhoid fever) still it is generally considered safest and best to vaccinate with dead bacteria. The vaccine slowly stimulates the production of antibodies, that is, in from five to eleven days, with an average of eight days. Some time later there is an increase in the opsonins and agglutinins. The blood generally shows the Widal reaction after the third inoculation. One case was found negative.[2]

Though it has been denied, it seems to be a fact that typhoid vaccine can cause a reaction similar to tuberculin in those infected with tuberculosis.

It has been shown that there is a skin typhoid reaction test similar to the von Pirquet tuberculosis skin test. Gay and Force found this test positive in 20 cases out of 21 (95 per cent.) patients who had recovered from typhoid fever. The same test was negative in 85 per cent. of 41 cases who had not had typhoid fever. This method may become valuable as

1. Russell, F. F.: House of Representatives Document 1404, Feb. 19, 1913.

2. Maverick, Augustus: Typhoid Vaccination and the Widal Reaction, THE JOURNAL A. M. A., June 1, 1912, p. 1672.

a test for the continuation of typhoid immunity after typhoid inoculation.[3]

With all the advantages to an individual and to a community conferred by protection against typhoid fever by vaccination, the physician must also carefully consider what constitutes contra-indications. It seems to be wise carefully to examine every individual to ascertain his condition of health before vaccination is done. It should not be done if he is suffering from any acute infection however simple, namely, a coryza, a pharyngitis, a tonsillitis, or any acute gastro-intestinal disturbance, gonorrhea, syphilis, albuminuria, glycosuria, or the more serious conditions of chronic nephritis or diabetes. The injections should be made in the afternoon, and the active symptoms will generally be gone by noon of the next day. Three injections should be given at weekly intervals.

There is a systemic reaction in about 7 per cent. of the cases, most frequently after the second dose, next in frequency after the first dose, and least frequently after the third injection. The temperature reaction varies, with an average of about 100 F., associated with malaise, rarely diarrhea and some nervousness and sleeplessness. Sometimes erythemas occur, and occasionally a herpes of the lips. Generally all active symptoms have disappeared in forty-eight hours. Every person inoculated with this vaccine should avoid alcohol and all stimulants, should not eat meat, should keep out of the sun, and should not take much exercise. While in the army the vaccinated men were allowed to do ordinary work, in private practice it is inadvisable to allow any exercise during a real reaction. If there is no reaction, the inoculated individual may do ordinary work on the following day.

It has been shown that paratyphoid fever may also be prevented by vaccination with the paratyphoid germs. It seems wise, therefore, in vaccinating against typhoid, to vaccinate with the combined vaccine of typhoid and paratyphoid. The ordinary adult doses for injection are as follows: The first dose may contain 500 millions of the killed typhoid bacilli, 250 millions of the killed "A" paratyphoid bacilli, and 250 millions of the killed "B" paratyphoid bacilli. The ordinary second dose is double this number of dead bacteria, respectively (1,000 millions of killed typhoid bacilli, 500 millions of killed "A" and 500 millions of killed "B" paratyphoid bacilli). The third injection represents the same number of killed bacilli as the second injection.

The method of injection is as follows: Paint with tincture of iodin an area about 15 mm. in diameter at the insertion of the deltoid muscle. Inject subcutaneously with sterile needles and the best vaccine the dose of killed bacteria decided on. Then paint the region with collodion and allow it to dry. If proper care is taken, no infection will occur, and, as above stated, a temperature reaction is rarely above 100 F., and perhaps never reaches as much as 102 F., even in exceptional instances. A severe reaction could only occur when there is some serious complication in the individual, as perhaps tuberculosis. All slight reactions are generally over in twelve hours and even severe ones are generally over in twenty-four hours.

The local reaction is greatest after the first dose, less after the second, and least after the third. Typically, there is an acutely inflamed area, varying in size, not hard and indurated like an incipient abscess. The arm may ache, and the axillary glands may become tender. The local reaction is generally at its height in about ten hours, and generally nearly gone in twenty-four hours. Any more severe reaction would be due to contamination.

The dosage for children should be based on the child's weight and not on its age. The recommended adult dose is based on a weight of 150 pounds. It seems to be necessary for continued protection to revaccinate children more frequently than adults, namely in about three years. The skin test above referred to may become a means of ascertaining whether, or not, the individual is still protected. It should be remembered that almost one-third of all typhoid deaths occur in persons under 20 years of age.

Typhoid vaccination as a treatment during the course of typhoid fever has not been much used. The theory against such vaccination is that it has seemed unwise, in any disease, to vaccinate and to stimulate an acute process, it being considered that the individual is utilizing all of his combative powers in fighting the infection that he already has. We must note, however, that cases are beginning to be placed on record in which it seems that relapses are prevented and that post-typhoid complications such as typhoid infection of the ears, kidneys, gall-bladder, etc., may be prevented by the judicious use of an antityphoid vaccine. Hospitals, which are the best prepared to carefully watch and judge of the advantages conferred by these injections, should investigate this subject. Until statistics are available, it may be well not to inject these bacilli until such time as the patient is shown to be a typhoid carrier. It is stated that stock vaccines in these instances are as valuable in preventing relapses as are autogenous vaccines.

About 4 per cent. of typhoid-cured patients become chronic carriers. As above urged, a most serious danger to any community is a typhoid carrier, and unfortunately it is difficult to discover such. As prevention is here also greater than cure, it is a question for the board of health to decide when a typhoid patient shall be released from quarantine, that is, allowed to deposit his urinary and fecal excretions in the sewers or privies without disinfection. Also a carrier may contaminate his hands with living typhoid bacilli, and thus spread the disease. This probably means that the feces and urine should be repeatedly examined by the board of health until typhoid bacilli are found to be absent. This would be a difficult problem, and would interfere more or less with individual freedom, but from an economic standpoint it would be the most money, health and life-saving work that a board of health could inaugurate.

A chronic typhoid bacillus carrier having been discovered (and such are only discovered by the attending physicians, hospitals, and boards of health being ever alert), he or she should be isolated and treated. Hexamethylenamin may cure a kidney infected with typhoid germs. Typhoid bacilli vaccines seem to offer the most successful treatment of these typhoid carriers. Whether they are best treated with stock vaccines or with autogenous vaccines is yet to be determined. Also, the frequency with which such cases are cured is not yet decided. If operative interference would remove the infection, it should be advised. This is especially true in cases in which either the gall-bladder or the ear is the suspected source of infection.

(To be continued)

3. The technic of this test will be found in Arch. Int. Med., March 15, 1914, p. 473.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street . . . Chicago, Ill.

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

Contributors, subscribers and readers will find important information on the second advertising page following the reading-matter.

SATURDAY, OCTOBER 31, 1914

THE BEGINNINGS OF PHYSICOCHEMICAL METHODS IN THE MEDICAL SCIENCES

The physician who has received his scientific training in recent years, and likewise he who, though schooled in an earlier era, has not allowed the progress of knowledge to leave him stranded on the shores of superseded ideas, is often prone to forget the beginnings of the learning which we call modern. Osmotic pressure, isotonic solutions and the ionic theory are familiar expressions. The brilliant contributions of van 't Hoff and Arrthenius have furnished the impetus for much in the more recent development of the medical sciences. To quote an eminent physiologist, it is impossible to-day to think of a scientific physiology or pathology in which the conception of osmotic pressure plays no part. It has furnished explanations for details of the chemistry of the circulation and the genesis of edema. The theories of narcosis and of disinfection have drawn heavily on it. Bacteriology and histology, with their problems of permeability and their technic of staining, have benefited by the present-day conceptions of osmotic pressures. Experimental embryology can point to the work of Loeb and his followers as a fruitful exemplification of the usefulness of the idea; for artificial parthenogenesis has long employed the physicochemical methods, and the newer culture of living tissues cannot neglect the theory of solutions.

In the light of the wide-spread importance of the subject—an importance that manifests itself in a practical way whenever a saline infusion is administered—it ought to interest those who have any concern whatever for the beginnings of scientific practices to hear something of the history of the idea of isotonic solutions and all that it carries with it. Fortunately the story has lately been told by one who took a most active part in its performances, namely, the well-known physiologist, H. J. Hamburger of the Dutch University at Groningen.[1]

It had long been known that many substances exhibit the property of "attracting water" to themselves. This force, *wasseranziehende Kraft,* as the Germans called it, is of great significance in the life of plants, in which it accounts for some of the movements of the sap and the unfolding of the parts. As early as 1844 Mitscherlich is said to have attempted to measure it in a quantitative way; but it was the botanist Hugo de Vries who described the first really successful methods at Amsterdam in 1882. By selecting solutions of various concentrations of the same substances he demonstrated that a definite strength always induced plasmolysis, that is, the beginning of shrinkage in the contents of plant-cells away from the walls of the latter. All solutions that just initiated this effect were termed isotonic by de Vries.

Hamburger relates how his laboratory chief, Donders, who had heard de Vries present his result to the Academy of Sciences, discussed them with the young assistant in physiology. The question at once was suggested whether similar osmotic phenomena would apply to animal cells. Thereupon Hamburger, then still a beginner in science, started the classic experiments on the behavior of red blood-corpuscles toward salt solutions, showing as early as 1883 that those concentrations of different salts in solution which just induce hemolysis show the same interrelations as those which de Vries had found isotonic in his plant experiments. The modern era of the application of physicochemical points of view to research in the medical sciences may be dated from these investigations, not from van 't Hoff's theory of osmotic pressures which was in reality developed somewhat later (1885) in its physiologic relations. Soon 0.9 per cent. sodium chlorid solution was ascertained to be isotonic with blood-serum, and its use to replace the older strength of 0.6 per cent. begun.

It would take us too far afield to recall the varied consequences of the early establishment of the principles of osmotic pressure. In passing, the significant studies on the bearing of this factor in lymph formation and movement, in absorption from the bowel and from serous cavities, and in the permeability of all kinds of cells, are brought to mind. It has been a period rich in suggestions and fruitful in results. We do well to present its beginnings in their true relations.

1. Hamburger, H. J.: Zur Geschichte und Entwicklung der physikalisch-chemischen Forschung in der Biologie, Internat. Ztschr. f. physik-chem. Biologie, 1914, i, 6.

PROBLEMS OF THE FEEBLE-MINDED

When legitimate methods of social inquiry and scientific investigation take the place of superficial observation, which is now becoming the case regarding the treatment of mentally defective children, it may be assumed that moot questions will be solved to the mutual satisfaction of all interested in the subject. It has been generally thought that an experienced observer can differentiate the feeble-minded from the normal by certain marked signs or tests. Thus, Barr has stated that "feeble-mindedness, including idiocy and imbecility, is a defect either mental or

moral or both, usually associated with some physical stigmata of degeneration." In a recent study by Karl Pearson,[1] contrary evidence is offered by groups of photographs showing feeble-minded, normal or mixed types of children of the same age. The observer will have difficulty in determining which of the children shown are the mentally defective. There seem to be no obvious stigmata differentiating one from the other, and in view of new evidence, for example, that the palates of the mentally defectives do not differ from those of the normal, and that the retina of imbeciles is not more often pigmented than the normal, it must be concluded that though physical stigmata may exist, scientific evidence is lacking to prove that they are pathognomonic. On the other hand, considering the question of mental differentiation, the recent work of Jaederholm[2] is taken as a center point. Pearson and Jaederholm have shown that any classification of children as mentally defective, below four years of mental defect, must either depend on the personal equation of the investigator, or be settled by other factors such as moral or physical deficiency.

Pearson takes issue with many other workers in the field of eugenics regarding the differentiation between the normal, feeble-minded or the mentally backward. The importance of a correct determination of these various classes for purposes of segregation and the protection of society can hardly be overestimated, and yet there are lacking truly scientific studies necessary to determine these problems. It is necessary to learn to what extent the mentally defective class is produced by inheritance, improper environment, or from poisoning of the parental system. Although there exist numerous casual investigations of the heredity of mental defects, there seem to be lacking adequate anthropometric measurements of the feeble-minded compared with controlled series of normal children, as well as psychometric studies and a purely scientific investigation of the factors of heredity and environment. The settlement of these questions cannot come from the physician alone, nor will the social investigator be able to determine it.

From our present knowledge we are not able to segregate all the feeble-minded. Although a mental test may strain off 20 or 30 per cent. of the so-called feeble-minded, beyond that point it is not reliable. What are needed are tests of self-control of emotions, of feelings and relation to social duties; in other words, tests of moral judgment. Until this type of investigation is adopted, segregation of the feeble-minded will be a matter of the personal equation of the investigator. These problems are vital and affect every community. They are not alone the care of the physician, but of all persons. The physician, however, must be able to determine early the need of help when it exists and be able to direct the proper procedure to better the conditions.

1. Pearson, Karl: Mendelism and the Problem of Mental Defect. III. On the Graduated Character of Mental Defect and on the Need for Standardizing Judgments as to the Grade of Social Inefficiency which Shall Involve Segregation, London, 1914.
2. Pearson, Karl and Jaederholm, J. A.: Mendelism and the Problem of Mental Defect. II. The Continuity of Mental Defect, London, 1914.

THE CAMMIDGE REACTION IN THE URINE—DEXTRINURIA

In 1904 Cammidge described a reaction, easily carried out in urine, which he frequently observed in the case of persons suffering from pancreatic disease and regarded as a useful indication in the ofttimes difficult diagnosis of affections of the pancreatic gland. The test involves the production of characteristic osazone crystals with the phenylhydrazine reagents after boiling urine, free from protein and preformed sugar, with hydrochloric acid. Apparently some complex carbohydrate-like substance is present in the reacting urines; and by hydrolysis with the acid, osazone-yielding products are produced. The directions for the procedure, which can be found in text-books on clinical diagnosis, include certain analytic details that must be carefully followed.

The clinical study of the diagnostic value and physiologic significance of the new "test" was promptly and eagerly undertaken. The conclusions in reference thereto have been conflicting, as is usually the case when a diagnostic novelty is initiated with unbounded enthusiasm. The physiologic chemist has been particularly interested in the possible nature of the substance responsible for the Cammidge reaction. Obviously it is something present in minute quantity, if at all, in normal urine; and it is devoid of the reducing power and other properties of most preformed sugars, otherwise it would reveal itself even without preliminary hydrolysis. Sucrose, pentoses, conjugated glycuronates, dextrins or so-called animal gums—all have been drawn into consideration by the different investigators.

The latest contribution on the subject, from the Physiologic Laboratory and the Surgical Clinic at Utrecht,[1] has confirmed the fact that the urines of different persons show a great difference in their tendency to exhibit the Cammidge reaction. Recalling the older observations of Baisch[2] and Lemaire[3] on the occurrence of small amounts of dextrin-like substances in the urine of healthy individuals, Pekelharing and Van Hoogenhuyze renewed the investigation of these poorly defined products, despite the fact that Cammidge himself did not regard the urinary dextrin as responsible for his reaction. They found, as a result, that urines in which the Cammidge test is positive, yield a larger amount of the indefinite dextrins than does normal urine. Furthermore, they ascertained that after hydrolysis these substances

1. Pekelharing, C. A., and Van Hoogenhuyze, C. J. C.: Ueber die Cammidgesche Pankreasreaktion, Ztschr. f. physiol. Chemie, 1914, xci, 151.
2. Baisch, K.: Ztschr. f. physiol. Chem., xviii, 193; xix, 339; xx, 249.
3. Lemaire: Ztschr. f. physiol Chem., xxi, 442.

yield the same types of osazones, with the characteristic shape, solubility, etc., as one obtains in the routine Cammidge test. The latter may thus be interpreted as the indication of a dextrinuria—or at least of an output of dextrin greater than is met with in ordinary experience.

Dextrinuria can be elicited in healthy persons by the excessive use of sugar. The Cammidge test has been obtained after ingestion of as little as 50 gm. (less than 2 ounces) of glucose or fructose. It has been observed within a few hours after eating 175 gm. of cane-sugar, although glycosuria was missed. The fact that the undue intake of sugar may occasion dextrinuria in healthy persons even before any glycosuria manifests itself may help to explain why the Cammidge reaction is reported to be positive in cases of pancreatic disease which have not yet progressed to the point at which true diabetic symptoms ensue. The study of dextrinuria, if it shall be established as a clinical entity, may furnish something of value in relation to carbohydrate metabolism. It is not unlikely that satisfactory quantitative methods of investigation—such as the estimation of the reducing power of the urine after hydrolysis—can be introduced into this field.

THE RELATION OF SEWAGE DISPOSAL TO WATER SUPPLY

The future development of large public water-supplies in this country is likely to involve the purification of surface waters rather than the utilization of ground water sources. Useful as the latter are under many conditions, they, nevertheless, in many regions are inadequate to supply the enormous demands of American municipalities. It is well known that surface waters in general are more or less contaminated. In the practical treatment of the water-supply problem the degree of sewage pollution that is admissible in the water to be purified has become more and more of a definite issue. There is now a sufficient amount of evidence to show that a dangerous situation is created when a great burden is placed even on the best constructed and most skilfully operated filter. If the water to be treated is very highly polluted the likelihood of accident is increased many times.

A noteworthy attempt to establish some sort of working standard for the character of raw water has been made by McLaughlin in a paper published in this number of THE JOURNAL.[1] This writer believes that in order to allow for a proper margin of safety the number of *B. coli* in the raw water should not range over 100 to 500 per hundred c.c. With such a water it is supposed that proper filtration—slow sand or mechanical—constitutes a reliable safeguard against water-borne infection. It must be admitted that the data on which such considerations are based are not very extensive, but so far as they go, they appear to justify McLaughlin's position. If the establishment of such a standard finds acceptance among water experts, it would seem to be desirable, by the use of hypochlorite or other means, to reduce the number of *B. coli* in highly polluted waters to not more than 500 per hundred c.c. before reliance is placed on ordinary filtration methods.

One merit of such work as McLaughlin's, based as it is on large practical experience in the field and laboratory, is that it brings into the open a very important question for discussion and further investigation. No one knows better than the experienced student of water bacteriology that the establishing of any standard opens the road to abuse and misconception. But it is of great advantage to have a definite standard proposed which can be discussed, compared with the varying experiences of different observers, and serve as a guide for interpreting the routine analyses which are sometimes accumulated without much understanding of their true significance.

McLaughlin suggests further that a content of two *B. coli* per hundred c.c. be accepted tentatively as the limit permitted for a good drinking water. He points out that at present a number of filter plants dealing with a badly contaminated raw water are able to yield a water which comes up to this standard. Although the commission appointed by the Surgeon-General of the United States Public Health Service to consider this matter has not yet made its formal report, we understand that its recommendations coincide with the standard proposed by McLaughlin, who, perhaps, has based his own opinion somewhat on the discussions of the commission. While this is not so severe a requirement as that advocated by Houston, director of water examination of the London Metropolitan Water Board, it is, nevertheless, more rigorous than would have been advanced in this country a few years ago.

Sooner or later the question will arise in connection with such standards as to how far the community is willing to go in the matter of protecting itself against water-borne infection. It is idle to insist that absolutely no chances must be taken, since accident and death are being continually risked in many other directions. The question will eventually come down to the expenditure that will be deliberately made in order to escape a given degree of danger. It is physically possible to sterilize absolutely any city water-supply, but few cities are prepared to face the expense necessary for complete removal of bacteria, pathogenic and non-pathogenic. McLaughlin's very interesting and suggestive paper dealing with the degree of permissible sewage contamination of raw waters and the allowable minimum of purification will tend to form opinion on this practical problem.

1. McLaughlin, A. J.: The Necessity for Restriction and Control of Sewage Pollution of the Great Lakes System, THE JOURNAL A. M. A., this issue, p. 1555.

THE DIFFUSION OF KNOWLEDGE OF THE MEDICAL SCIENCES

The science of medicine, like that of agriculture, has been the subject of extensive investigation and intensive study in the last half century, with the result that our fund of knowledge in both of these domains of interest has been greatly augmented. Even to-day, as in the past few decades, we are witnessing the continued organization of forces and institutions intended to promote not only medical and agricultural sciences, respectively, but likewise their practical application. Only he who is blind to what has been accomplished would deny the advantages which have accrued wherever intelligent use has been made of the contributions involved in the fundamental discoveries. The practice of medicine, like the art of agriculture, is more and more becoming transformed into a scientifically controlled performance.

We have been reminded of the similarity of experience in the realms of agriculture and medicine by reading a recent report from one of the leading agricultural experiment stations of the United States.[1] This document points out that whereas in the earlier years of the modern scientific movement in agriculture, much emphasis was laid on the study of the physical and biologic problems of production, there is now need of greater attention to the economic forces involved in distribution. It has become important for the farmer to learn when and how to market his produce, quite as well as what to produce and how to produce it most economically.

Precisely so, modern medicine must be judged in part by the practical advantages secured through its investigations. Medical research needs the help of some force or forces which will serve not only to spread broadcast the story of its beneficent discoveries, but also to teach where and how they may be applied. There is room for added agencies which will translate the findings of the laboratories into the requirements of practice. The new contributions of hemodynamics deserve speedier recognition in the clinic of diseases of the heart; the latest experiences with synthetic drugs should be made to suggest possible applications in bedside therapeutics; the progress of the modern study of nutrition might well be carried more freely into the domain of practical dietetics. There are, furthermore, aspects of medical science which the general public is entitled to know and to be instructed in.

Modern agriculture already has effective helps at hand to bring its scientific contributions forcibly to the attention of those who need to apply them. Medicine likewise has ways of spreading its propagandas; but are we not justified in calling for more talent and greater activities in teaching the lessons of the hour more promptly and effectively? The duty of the "diffusion of a knowledge of the medical science"—to quote the motto of the Harvey Society of New York—is worthy of serious consideration in the midst of the ceaseless investigations of the present day.

In his address as president to the Physiological Section of the British Association for the Advancement of Science at the meeting in Australia this summer, Prof. Benjamin Moore of Liverpool urged the campaign of education from a still different point of view. It is particularly important at the present moment, he said, when so much interest is being taken in national health, to point out the urgent necessity of allowing as little lagging behind as possible to ensue between the making of discoveries and the practical application of the results by organized national effort for the well-being of the whole community. And, again, Moore said that it is well worth while to consider our opportunities and responsibilities and raise the question whether our present system and organization are the most suitable for attaining one of the most sublime ambitions that ever appealed to any profession. By definition, our science studies the laws of health and the functions of the healthy body; therefore, it is ours to lead in the quest for health. Is this object best achieved, Moore asks, if we confine ourselves to research in our laboratories, and to the teaching of the principles of physiology to medical students, while we leave the community as a whole uninstructed as to the objects of our research and its value to every man, and trust the medical students whom we turn out to communicate, or not, as they choose, the results of their training and our research to the world?

1. Wisconsin Agric. Expt. Sta., Report of the Director for 1913.

Current Comment

THE QUACKS' HOROSCOPE

If there were anything in astrology, we should have read something like this:

> OCTOBER, 1914: This is a month in which Saturn rules strongly in favor of the public health, and while this configuration prevails, it augurs ill for quacks and charlatans. The horoscope of the medical faker presages danger, and those that are prudent will seek the cyclone cellar.

On October 7 "Professor" Samuels, the Wichita faker, was found guilty in the federal courts on eleven counts; the maximum penalty for each count is a fine of a thousand dollars and five years in prison. Samuels amassed wealth by swindling the sick and suffering by selling a mixture of sugar, salt and water as a cure for practically all diseases. His methods have been repeatedly exposed in THE JOURNAL.[1] On Oct. 22, 1914, Orlando Edgar Miller, late of Chicago and Denver, was sentenced to prison in London after being convicted of having caused the death of a woman by administering a drug while she was a patient in an alleged sanitarium he conducted. Miller will be remembered by readers of THE JOURNAL as the quack who exploited the so-called "International

1. "Nostrums and Quackery," pages 282 to 287; also in the pamphlet "Medical Mail-Order Frauds," price 10 cents.

Institute for the Treatment of Tuberculosis" in Chicago. THE JOURNAL investigated[2] Miller and his "institute"; showed up the quack's record; proved that over 80 per cent. of his victims died under treatment and in general turned the search-light on the scheme. The exposé brought two results: one, an action for libel against THE JOURNAL which never came into court; the other, the downfall of Miller's "institute." On Oct. 21, 1914, Dr. Richard C. Flower was arrested in Canada on a charge of grand larceny. Flower has been a fugitive from justice for some years and is said to have swindled the public out of more than a million dollars. He founded the "R. C. Flower Medicine Company," a mail-order medical fraud whose president was B. O. Flower,[3] president and one of the founders of the "National League for Medical Freedom." Altogether, the present month has proved a bad one for medical fakers.

ALLEGED MODIFICATIONS OF THE GASTRIC JUICE

Not long ago we reviewed the evidence indicating that the acidity of the gastric juice of man is decidedly higher than is commonly believed; and an explanation was offered for the familiar figures found on analysis of gastric contents instead of the concentration of about 4 per thousand (0.4 per cent.) of hydrochloric acid indicated by a large number of examinations of pure human gastric secretion.[4] The deviations from this higher figure are, as it now appears, not due to variations in the concentration of the juice actually produced, but rather attributable to the neutralizing effect of substances like mucus, etc., with which the juice comes into contact in greater or lesser degree. This fact has raised new questions with respect to the interpretation of alleged cases of hyper- or hypoacidity. To what extent are high or low figures for hydrochloric acid due to variable admixture or hitherto unsuspected regurgitation of alkaline duodenal contents? The new point of view here presented has also occasioned some uncertainty regarding the experimental devices which have been described for initiating conditions comparable with those in human gastric pathology. It is generally admitted that the volume of the secretion can be profoundly influenced both by the character of the diet and by reflex stimuli which are initiated in the intestine beyond the stomach. Further than this, it has been asserted that the acid concentration of the gastric secretion is likewise affected. To cite a specific illustration, Cohnheim[5] believed that he could induce a true pathologic hypoacidity by the introduction of common salt into the duodenum; and correspondingly an abnormal hyperacidity was reported as the result of introduction of Epsom salt. Newer investigations in the pathologic institute of the University of Berlin[6] fail entirely to substantiate the foregoing. It is true that the quantity of gastric secretion can be decidedly modified by such procedures. Its volume is enhanced by magnesium sulphate and diminished by the presence of sodium chlorid in the bowel. The quality of the gastric juice, however, is not altered by these salts.

2. "Nostrums and Quackery," pages 115 to 130; also in the pamphlet "Consumption Cure Fakes," price 10 cents.
3. For details send stamp for pamphlet "National League for Medical Freedom."
4. The Induction of Gastric Secretion, editorial, THE JOURNAL A. M. A., March 21, 1914, p. 934.
5. Cohnheim, O.: Ztschr. f. physiol. Chem., 1908, lviii; 1909, lxiii.
6. Sato, S.: Direkter Beweis, dass es nach Kochsalz- und Magnesiumsulfat-Infusionen in den Darm keine pathologische Veränderungen in der prozentualen Säurekonzentration des reinen Magensaftes im Sinne O. Cohnheim's gibt., Ztschr. f. physiol Chem., 1914, xci, 1.

STANDARDIZING COLLEGES OF LIBERAL ARTS

Following the remarkable improvements in medical education resulting from the inspection and classification of medical colleges, a decided movement has been started toward the standardization of colleges of liberal arts. Within the last year the Association of American Universities has published a list[1] of 119 colleges and universities the degrees of which are recommended to German universities as an acceptable qualification for entrance to courses for higher degrees. Another list of approved colleges has been published[2] by the North Central Association of Colleges and Secondary Schools, for the fifteen states under the jurisdiction of that organization. This list has seventy-two colleges, including thirty-five which are also on the list of the Association of American Universities. A third organization, the Association of Colleges and Secondary Schools of the Southern States, is also contemplating the publication of an approved list. The United States Commissioner of Education has issued invitations to fourteen different organizations, including the Council on Medical Education of the American Medical Association, to appoint representatives who will cooperate in the work of classifying colleges and universities. Since the entrance requirement for all medical colleges in classes A+ and A now include at least one year of collegiate work in addition to a standard high school education, such a classification will be of great service in deciding what credentials are acceptable.

COLLOIDAL NITROGEN COMPOUNDS IN THE URINE

Not long ago we took occasion to record a controverted claim emanating from the clinical study of cancer and to point out how short-lived many of the hypotheses with respect to the metabolism in this disease have been.[3] The unfulfilled promise in the instance alluded to concerned the alleged augmentation of the so-called oxyproteic acid fraction of the urine as a characteristic of carcinoma. As early as 1905 Salkowski[4] called attention to the fact that the nondiffusible components of human urine appear to be increased in certain pathologic conditions. The substances represented by this fraction of the secretion of the kidneys correspond to what modern terminology would designate as colloids. Since this newest feature of physical chemistry has come into conspicuous prominence in recent years and colloid chemistry has lately

1. Educational Review, December, 1913, p. 516.
2. Proc. Ninth Annual Meeting of the North Central Association of Colleges and Secondary Schools, 1914, p. 43.
3. The Urine in Carcinoma, editorial, THE JOURNAL A. M. A., Aug. 15, 1914, p. 585.
4. Salkowski, E.: Berl. klin. Wchnschr., 1905, p. 1581.

gained a considerable vogue in biology and medicine, it is only natural that variations in the colloids of the urine should prove a popular topic for investigation whenever the application of a study thereof seemed likely to disclose something of a pathologic interest. The attempts to correlate apparently abnormal proportions of urinary colloids with specific diseased states have had their ups and downs in very recent times. Some investigators, in their enthusiasm for a new method of investigation, have overlooked the almost insuperable analytic difficulties attending a study of so indefinite a factor as urine colloid. It seems scarcely worth while to review the history of the subject further than to record the conclusion of the latest investigators in this field. Drs. de Bloeme, Swart and Terwen[3] of the pathologic laboratory at the University of Amsterdam have been unable to discover any higher values for the colloidal nitrogenous products in the urine in carcinoma than in other diseases; in fact, there has been no uniformity of results such as would permit any rational interpretation for diagnostic purposes. There are certain features of the problem which may merit renewed investigation; but these latest reports support the contention of "not proven" and call for conservatism in the valuation of the claims of chemical indications of malignant disease.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Sanatorium Dedicated.—The Red Mountain Sanatorium of the Jefferson County Anti-tuberculosis Association was dedicated October 4.

Personal.—Drs. Walter S. Rountree, Wyiam; Dyer F. Talley, Birmingham; John N. Furniss and James Kenan, Selma, have returned from abroad.——Dr. Arthur H. Montgomery, Montgomery, has been designated as physician for the federal prisoners in the Montgomery County Jail.——Dr. Milton C. Ragsdale, Jr., has been elected city physician for Bessemer.——Dr. Andrew M. Stovall, Jasper, was thrown from his buggy in a runaway accident recently, fracturing his right arm below the elbow.

Health Conditions in Alabama.—According to the monthly report, issued October 14, of Dr. Henry G. Perry of Montgomery, head of the state department of vital and mortuary statistics, twenty-one counties are infected with pellagra. There are thirty-six cases in one county alone. The Thompson-McFadden Commission, which is represented in Alabama by Dr. J. F. Siler of Birmingham, is investigating the condition. For the first time in several years the state is entirely free from cerebrospinal meningitis. There are mild cases of small-pox in Jefferson and Butler counties and cases of scarlet fever in Marengo and Lauderdale counties.

CONNECTICUT

Personal.—Dr. Michael J. Sheahan, Derby, sailed for Europe, October 17.——Drs. Clifton M. Cooley, Waterman Lyon and George H. Dalton have been appointed school inspectors of New Britain.——Dr. Albert C. Thomas, superintendent of the New Haven Hospital, has been appointed superintendent of the Massachusetts State Hospital, Foxboro.

3. De Bloeme, P. L. J.; Swart, S. P., and Terwen, A. J. L.: Der kolloidale Stickstoff des Harns und seine Bedeutung für die klinische Carcinomdiagnostik, Biochem. Ztschr., 1914, lxv, 345.

DELAWARE

State Society Officials.—In addition to the officers of the Delaware State Medical Society noted in THE JOURNAL of October 24, page 1487, Dr. Albert Robin, Wilmington, was elected alternate delegate to the American Medical Association and Drs. Peter W. Tomlinson, Wilmington; George W. Marshall, Milford, and James Beebe, Lewes, were elected councilors.

GEORGIA

Personal.—Drs. George R. White and Walter A. Norton, Savannah, have returned from abroad.——Dr. John S. McKenzie, Cordele, was thrown from his automobile recently, fracturing his right arm.

Medical Board Election.—At the meeting of the State Board of Medical Examiners in Atlanta, October 14, Dr. Nicholas Peterson, Tifton, was elected president, and Dr. Richard E. Hinman, Atlanta, vice-president, and Dr. Charles T. Nolan, Marietta, reelected secretary-treasurer.

ILLINOIS

Southern Illinois Physicians to Meet.—The fortieth annual meeting of the Southern Illinois Medical Association will be held in Mt. Vernon, November 5 and 6.

Personal.—Dr. James F. Dixon, West Salem, has been appointed resident physician of the St. Charles' School for Boys, succeeding Dr. Charles A. Potter.——Dr. Catherine B. Slater, Aurora, has returned from abroad.

Small-Pox, Scarlet Fever and Diphtheria.—Twenty-one cases of small-pox are reported from Neponset and its vicinity and twelve cases from Zion City. In the latter locality forcible resistance to vaccination by the city authorities is advocated by the head of the Dowieite community, on religious grounds. As strict a quarantine as possible has been established by the State Board of Health.——Fifty-three cases of scarlet fever were reported in Peoria up to the middle of October. Schools were closed in Delavan on account of scarlet fever during the week of October 17.——Cases of diphtheria are reported from Monticello.

Chicago

Clinics for Visiting Physicians.—At Wesley Hospital, clinics for visiting physicians will be conducted throughout the year by Dr. W. E. Schroeder. The work, which is surgical, will be given on Thursdays and Saturdays from 10 to 12 o'clock.

Tuberculosis Society Meeting.—The fourteenth meeting of the Robert Koch Society for the Study of Tuberculosis, affiliated with the Chicago Tuberculosis Institute, was held October 29, the general topic for the meeting being "Tuberculosis of the Larynx."

Mothers' Aid Pavilion Opened.—The Mothers' Aid Pavilion of the Chicago Lying-In Hospital, was formally opened October 31. A special reception to doctors and nurses was held on the previous day. The pavilion has been erected at a cost of $85,000 and accommodates sixty patients.

Tuberculosis Conference.—The second general tuberculosis conference under the auspices of the Chicago Tuberculosis Institute will be held November 12 at the City Club, 315 Plymouth Court, following an informal dinner at 6 o'clock. The subject for discussion will be "The Cooperation of Public Health Nurses and Social Workers in the Early Detection and Control of Tuberculosis."

IOWA

Diphtheria.—Sixty-eight cases of diphtheria are reported from Cincinnati, Iowa, where all churches, stores and schools are closed and the town is quarantined. Cases are also reported from Tipton, Clarion and Davenport.

Hospital Addition Dedicated.—The addition to the Mercy Hospital, Des Moines, was dedicated with impressive ceremonies, October 8. During the exercise, announcement was made of the establishment of a hospital memorial consisting of an endowment of two wards to perpetuate the memory of the late Mr. and Mrs. Jefferson S. Polk.

Personal.—Dr. Arthur L. Washburn, formerly of Boston, has been appointed health commissioner of Oskaloosa, succeeding Dr. Herbert L. Eisler, resigned.——Dr. Frank W. Porterfield, Waterloo, has been appointed division surgeon of the Illinois Central System.——Dr. Thomas J. Burke and family, De Witt, have returned from abroad.——Dr. Arthur J. Ross, Perry, who has been ill in the King's Daughters'

Hospital for several weeks, is reported to be convalescent and has returned home.——Dr. Frank G. Murphy, Mason City, who has been ill in the hospital for eleven weeks, has recovered and resumed practice.

KANSAS

Personal.—Dr. Oscar M. Owensby, Pittsburg, has started for Europe in the Red Cross service.——Dr. John B. Dykes, Lebanon, has been nominated for congress on the Republican ticket.——Dr. Matthaus H. Horn, Morrowville, has returned from Europe.

Diphtheria Among "Holy Rollers."—Diphtheria, which is said to have been prevalent for two weeks in Gas City, is now considered under control. The epidemic is said to have originated among a sect known as the "Holy Rollers." Instead of calling a doctor, the members of the settlement went to the house of the patient and prayed over him. Dr. John S. Sutcliffe, health officer of Allen County, has ordered the religious organization to cease both private and public meetings until further order.

KENTUCKY

Kelly in Lexington.—Dr. Howard Kelly, Baltimore, visited Lexington, October 22, and delivered an address on "Social Hygiene."

Personal.—Dr. Charles H. Todd, Owensboro, is seriously ill at his home as the result of a cerebral hemorrhage.——Dr. John Todd has been reelected health officer of Newport.

The Horse-Meat Scandal.—The Louisville Health Department has been active in the last few weeks in an investigation and arrangement for the prosecution of certain butchers accused of selling horse-meat for beef. The publication of these reports has aroused all of the commercial organizations of the city, and efforts looking to a municipal abattoir have been inaugurated with every hope of success.

Public Health Work.—Drs. Joseph A. Stucky and Samuel B. Marks, Lexington; Dr. Louie E. V. Stegman, Battle Creek, Mich., and Dr. Isaac S. Manning, Manchester, together with trained nurses, visited Oneida recently, established a clinic at that place and opened the hospital which has just been completed. During this trip they examined the school-children of the county, and made investigations regarding trachoma and other infectious diseases.

Trachoma and Hookworm.—At the suggestion of Dr. Arthur T. McCormack, Bowling Green, secretary of the State Board of Health, the Fiscal Court of Jefferson County appropriated $2,500 for fighting trachoma in the county and $2,000 additional for a sanitary survey of the county.——Dr. Martin W. Steele, Bowling Green, state sanitary inspector, reports having closed a three weeks' health campaign in Owsley County during which about one-half the entire population was examined for hookworm, and 42 per cent. found infected. All received treatment. Dr. Steele attributes the success of the work very largely to the splendid professional spirit among local doctors. Dr. Steele opened an eight weeks' campaign in Pipe County, October 16, and expects to answer an urgent request from Lee County with two or three weeks' work there. Dr. Isaac A. Shirley of Winchester is carrying on similar work in Letcher County.

LOUISIANA

School Inspection Volunteers.—Twenty physicians connected with the School of Hygiene of the Tulane University, headed by Dr. William H. Seeman, have volunteered to assist Dr. Edmund Moss, medical inspector of public schools in New Orleans, in making a medical inspection of school children.

State Tuberculosis Home.—Dr. Oscar Dowling, president of the State Board of Health, went to Alexandria, October 17, to look over the proposed site for the State Tuberculosis Sanatorium. The state board announces that it has the prospect of a donation sufficient for the establishment of a laboratory for the production of diphtheria antitoxin and Dr. Dowling hopes that with this sum in his possession, he may be able to set aside a portion for the site of a tuberculosis hospital and serum farm and to produce there other serums for distribution to the poor of the State.

Personal.—Dr. Charles F. Gelbke, Gretna, has been appointed a member of the State Board of Health, vice Dr. Herman Oechsner, New Orleans, term expired.——Drs. Ludwig C. Heintz, Abita Springs; J. F. Buquoi and Henry E. Gautreaux, have resigned as members of the Board of Health of Covington, it is said on account of the opposition displayed by a large proportion of the citizens to the enforcement of sanitary regulations, especially regarding out-houses.——Dr. Otto Joachim, New Orleans, who has been treating the wounded in the Military Hospital at Landau, Bavaria, has started for home.——Dr. Joseph A. Danna has been honored by the king of Italy with the title of Chevalier in acknowledgment of the service Dr. Danna has rendered the Italians of New Orleans.

MASSACHUSETTS

New Health Commissioner Begins Work November 1.—Surgeon Allan J. McLaughlin, U. S. P. H. S., the newly appointed health commissioner of Massachusetts, expects to assume the duties of his office November 1.

Personal.—Dr. Arthur J. White, executive assistant of the Boston City Hospital, has been appointed superintendent of the Consumptive Hospital to succeed Dr. Simon F. Cox, resigned.——Dr. William H. McBain, Malden, has been appointed associate medical examiner of Middlesex County.——Dr. Maurice L. Slutskin, Springfield, opened a new dispensary, October 13.

Parental School for Isolation Hospital.—The Boston City Hospital trustees have given up the plan for the erection of a new contagious disease building for which an appropriation of $297,000 has been made and will utilize for this purpose several buildings connected with the parental school, at an expenditure of about $150,000. The plans for the institution provide for the accommodation of 200 patients, each of whom will have a separate room in order to avert the possibility of cross infection.

MICHIGAN

Ottawa County Physician Honored.—A banquet was given in Grand Haven recently in honor of Dr. William DeKleine, who after eight years of residence in the county, has gone to Ann Arbor to take up post-graduate work in the medical department of the state university.

Personal.—Dr. Perly W. Pearsall, Kalkaska, has been appointed division surgeon of the Pere Marquette System and has been transferred to Muskegon.——Dr. Carl C. McClelland has been elected secretary of the medical staff of the Grace Hospital, Detroit, vice Dr. Leonard F. C. Wendt, resigned.

Baby Clinic Opened.—The Detroit Board of Health opened a free clinic at 508 Wesson Avenue for diseases of children and tuberculosis. This institution, together with the health sanatorium recently established on Dubois Street, is under the supervision of the health department nurses, with Dr. Victor C. Vaughan, Jr., Detroit, in charge of the tuberculosis division.

European Travelers.—Dr. Charles H. Baker, Bay City, Dr. Ignatz Mayer and Dr. and Mrs. Max Ballin, Detroit, have returned from abroad.——Dr. Cedric P. Sibley, Detroit, is doing work as a volunteer medical officer in a Vienna military hospital.——Dr. Edward H. Moriarity, Mount Clemens, has started for Ireland to join the medical corps of the Irish contingent of the British army.

MISSOURI

Health Conference Called.—A general conference on health measures has been called by the State Board of Health to convene at St. Joseph, November 27 and 28, to consider the advisability of permanent organization.

Personal.—Dr. Luther A. Todd has been appointed a member of the board of health of St. Joseph, vice Dr. Oliver C. Gebhart. At a meeting of the board of health October 13, Dr. Todd was elected president.——Dr. Hurel Perrie Hueyette, Kansas City, was shot and slightly injured by a patient from whom he was trying to collect a bill.——Dr. John Paul Owen, Kansas City, sailed for Europe October 15.

Children's Building for Mount Vernon.—At the annual meeting of the Missouri Association for the Relief and Control of Tuberculosis, the intention was announced to erect a childrens' building at the State Sanatorium, Mount Vernon, to cost $50,000. The association elected a legislative committee consisting of Dr. William S. Allee, Olean; Dr. Frank G. Harris, Columbia, and Dr. James Stewart, St. Louis. This committee will draw up and have presented to the state legislature, bills to enable the association to carry out a state-wide work in the movement against tuberculosis.

St. Louis

Home from Europe.—Dr. Solomon A. Weintraub, Dr. and Mrs. Max A. Goldstein and Dr. James C. Whitley have returned from abroad.

Personal.—Dr. William Porter announces his removal this month from St. Louis to Ocean Springs, Miss. Dr. David R. Lamb will continue Dr. Porter's work in tuberculosis.——Dr. Joseph W. Charles, St. Louis, has been appointed a member of the board of managers for the Missouri School for the blind, succeeding the late Dr. M. Hayward Post.——Dr. David Schmalhorst suffered severe injuries in a collision between the motor car in which he was riding and a trolley car, October 14.

MINNESOTA

Sanatorium Site Decided.—Worthington has been decided on as the site for the new Southwest Minnesota Tuberculosis Sanatorium.

Personal.—Dr. Delbert F. Dumas has been appointed health officer of Cass Lake to succeed Dr. Roydon B. Yoder. ——Dr. Thomas C. Clark, Stillwater, has taken up the duties of surgeon of the Soldiers' Home, Minnehaha.——Dr. Herbert G. Lampson, Rochester, has moved to Minneapolis, where he will do special work with the State Board of Health.

Medical Fellowships.—Three of the five teaching fellowships in medicine, established by the University of Minnesota, have been awarded. These are as follows: fellowship in diseases of the eye, ear, nose and throat, Dr. Henry E. Binger, Minneapolis; fellowship in surgery, Dr. Golder L. McWhorter, Algona, Ia., and fellowship in obstetrics, Dr. E. S. Moore, Washington, D. C.

NEVADA

State Society Meeting.—At the annual meeting of the Nevada State Medical Association held in Reno, October 13 to 15, the following officers were elected: president, Dr. Patrick J. Mangan, Winnemucca; vice-presidents, Drs. James C. Ferrell, Fallon, and Arthur J. Hood, Elko; secretary-treasurer, Dr. M. A. Robison, Reno (reelected); delegate to the American Medical Association, Dr. M. Rollin Walker, Reno; and alternate, Dr. Arthur P. Lewis, Reno. The next meeting will probably be held in Reno, a week before the American Medical Association meeting in San Francisco. The *California State Journal of Medicine* was decided on as the official organ of the Association.

NEW JERSEY

Entertains Medical Society.—Dr. Frank M. Donohue, New Brunswick, entertained the members of the Middlesex County Medical Society and guests, at his country home, Cedar Crest, October 7.

Hospital Cornerstone Laid.—The cornerstone of the medical building of the Mountainside Hospital, Montclair, was laid by Mrs. Franklin H. Hooper, president of the board of governors, October 10. The new building was made possible by a whirlwind campaign conducted one year ago in which $230,000 was raised.

NEW YORK

Personal.—Dr. Barton McC. Cookingham, Red Hook, sailed for Europe October 17.——Dr. Joseph E. Clark, Yonkers, has been appointed by the State Commissioner of Health, sanitary supervisor of District E., which includes Oneida and Herkimer counties.——Dr. James S. Walton, Amsterdam, has been appointed sanitary supervisor of the district, including Montgomery, Fulton and Hamilton counties.

Buffalo "Better Mothers" Contest.—The city of Buffalo held a "Better Mothers" contest September 21 to 25, during which 540 entries were registered and 145 mothers, having received over 95 per cent. on the ratings of their babies, were awarded diplomas of efficient motherhood. The contest, which is said to have aroused interest in mothers of all classes, is intended to be the beginning of a continuous propaganda by which mothers will be encouraged to have their children thoroughly examined from time to time to discover any defects and to install measures for their correction.

Error in Using "Typhoid" for "Typhus."—Dr. Joseph J. O'Connell, Rosebank, health officer of the port of New York, calls attention to an error in the printing of a summary of the department's work in THE JOURNAL, October 17, p. 1402. THE JOURNAL stated that twenty cases of typhoid fever were removed from thirteen vessels with a record of eighteen recoveries and two deaths. The report actually stated that twenty cases of typhus fever were removed from these thirteen vessels and that 2,633 typhus fever contacts were removed and treated so successfully that there were no secondary cases among them.

Harvey Society Lectures.—The tenth course of Harvey Society lectures was inaugurated October 10. The lectures are given on alternate Saturday evenings at the New York Academy of Medicine. The following is the schedule for the course: October 10.—Prof. Frederick P. Gay, University of California, "Experimental Studies on Methods of Anti-typhoid Immunization." October 24.—Prof. Thomas Lewis, University of London, "The Excitatory Process in the Heart." November 7.—Prof. Arthur S. Loevenhart, University of Wisconsin, "Certain Aspects of Vital Oxidation." November 28.—Prof. Lafayette B. Mendel, Yale University, "Nutrition and Growth." December 12.—Prof. Lawrence J. Henderson, Harvard University, "The Excretion of Acid in Health and Disease." January 16.—Dr. Edward R. Baldwin, Adirondack Cottage Sanitarium, "Immunity in Tuberculosis with Special Reference to Racial and Clinical Manifestations." January 30.—Prof. Hans Zinsser, Columbia University, "The More Recent Developments in the Study of Anaphylactic Phenomena." February 13.—Prof. John A. Fordyce, Columbia University, "Some Problems in the Pathology of Syphilis." February 27.—Prof. Robert R. Bensley, University of Chicago, "Structure and Relationships of the Islets of Langerhans and Criteria of Histological Control in Experiments on the Pancreas." March 13.—Prof. Elliott P. Joslin, Harvard University, "Carbohydrate Utilization in Diabetes Based upon Studies of the Respiration, Urine and Blood."

New York City

Dermatologic Clinics.—The New York Skin and Cancer Hospital announces the annual course of lectures by Dr. L. Duncan Bulkley. The lectures will be given Wednesday afternoons at 4 o'clock and will be preceded by a half-hour clinical demonstration of dermatologic cases.

Lectures for Health Department Employees.—The Bureau of Public Health Education of the Department of Health has organized a series of lectures which will constitute a sort of school of sanitary science for health department employees. The lectures will be held weekly at Hunter College and will continue through February, 1915. There are courses for physicians, for nurses, for hospital nurses and for field nurses, that is, for the nurses of the bureaus of infectious diseases and of child hygiene. Employees are expected to be prepared to pass an examination at the end of the course on the subjects presented.

An Experiment in Local Health Administration.—The *Weekly Bulletin* of the city department of health, October 10, reports the experimental establishment of a health district in the neighborhood of Gouverneur Hospital where the department intends to try out the experiment of local self-government in health matters. The new administrative feature consists of the government of the district from within the district itself instead of from the department headquarters and under the control of field workers in place of various bureau chiefs. The department does not commit itself to the wider adoption of the plan but wishes to study it in actual operation.

NORTH CAROLINA

County Hospital Nearly Ready.—Wake County Hospital, erected at a cost of $75,000, is nearing completion and will be ready for occupancy early in January. The building is of fire-proof construction and is said to represent the last word in hospital construction.

Personal.—Dr. Charles F. Strosnider, Mount Olive, is taking postgraduate work in the East and expects to locate in Wilmington early in 1915.——Dr. Robert Vance Brawley, Salisbury, who has been taking postgraduate work in Baltimore, has returned and resumed practice.——Dr. John B. Wright, Lincolnton, has located in Raleigh where he has associated in practice with Drs. Richard H. Lewis and Kemp P. Battle, Jr.

OKLAHOMA

Society to Assume Charge of School Inspection.—At a meeting of the Washington County Medical Association held in Bartlesville, recently, the president of the Board of Education, made a formal request to the members of the Society to take charge of the examination of the pupils of the district and the Association agreed to perform the work.

Personal.—Dr. Edward S. Gooch, Lawton, has returned from a trip to Canada.——Dr. Robert T. Kelleam, Sallisaw, recently sustained slight injuries in a runaway accident.——Dr. Luther W. Troutt, Afton, fractured his forearm recently while cranking his automobile.——Dr. George S. Barger, Wayne, is preparing to return to his old home in Illinois.

State Health Board Exhibit.—The State Board of Health, which has been making an educational campaign throughout the state in the interest of good health, in the past year, brought its exhibit to the State Fair, Oklahoma City. The exhibit is in charge of Dr. John C. Mahr, Shawnee, state health commissioner, and Dr. Curtis R. Day, dean of the State Medical School and Dr. Richard T. Edwards of the faculty of that school.

Dr. Border Secures Conviction of Enemies.—On October 14, the jury in Judge Thacker's court at Mangum, in the case of a number of defendants who were charged with "conspiring to produce an abortion on a pregnant woman," returned a verdict of guilty as to each of them. The trial was the outgrowth of a scheme which, it is alleged, was concocted to ruin the mayor of Mangum, Dr. Fowler Border, in a political way. He became apprised of the scheme and was able to turn the tables. It is alleged that the Mangum Electric Company was behind the conspiracy because it was against the voting of bonds to build a municipal light plant which the mayor favored. The secretary of the company was among those convicted. The convicted persons endeavored to induce Dr. Border to perform an abortion on a pregnant woman.

PENNSYLVANIA

Typhoid at Lehigh Traced.—The investigation of the State Department of Health of the recent typhoid fever epidemic at Lehigh University where forty students were infected, has traced the source of infection to a kitchen employee who, though long since recovered from an attack of typhoid, still carried the germs.

Philadelphia

Personal.—Dr. J. William White, emeritus professor of surgery at the University of Pennsylvania, and Dr. R. Tait McKensie, head of the department of physical education, have volunteered their professional service to the British government.——Dr. Elwood R. Kirby has been appointed chief consulting surgeon of the Masonic Home at Elizabethtown, Pa.

Post-Graduate Clinics on the Heart and Lungs.—Beginning with the first Friday afternoon in November and continuing throughout the winter on Friday afternoons from 5 to 6 p. m., Dr. Robert N. Willson will give in the amphitheatre of the Philadelphia General Hospital, Pine and Thirty-Fourth streets, a series of demonstrations on the diseases of the heart and lungs. These clinics will be informal and a cordial invitation is extended to physicians, as well as to undergraduate medical students, to attend. The subjects under discussion during November will be the anatomy and physiology of the heart and vessels.

SOUTH CAROLINA

District Society Organized.—The Fifth District Medical Association, including the counties of Chester, York, Lancaster, Cherokee, Fairfield and Chesterfield, was organized at Chester, October 5, and the following officers were elected: president, Dr. Ebenezer W. Pressly, Clover; vice-presidents, Drs. Robert T. Ferguson, Gaffney; and Samuel Lindsay, Winnsboro; secretary-treasurer, Dr. George A. Hennies, Chester.

Adopts Model Law.—The State Board of Health at its meeting in Columbia, October 7, adopted the model vital statistics law, which was passed by the last general assembly and approved by the governor. The law is already in force in North Carolina and Virginia. Under the terms of the law, the state is divided into districts which are made up of cities, incorporated towns and townships.——Dr. James A. Hayne will be state registrar of vital statistics and will appoint local registrars who will be paid twenty-five cents for each death and birth reported to the state officials.

TENNESSEE

Wyeth in Chattanooga.—Under the auspices of the Chattanooga College of Medicine and Hamilton County Medical Society, Dr. John A. Wyeth, New York City, lectured in Chattanooga, October 2, on "The Great Republic."

Sanitary Inspection Service.—The State Board of Health reports that during the quarter ended September 30, over 13,000 microscopic examinations for hookworm were made in the state. In the counties of Grainger, Polk, Sevier, Sumner and Union 2,657 cases of hookworm received free treatment in dispensaries. During the current quarter there will be free dispensaries established in Bedford, Scott and Unicoi counties.

Personal.—Dr. Thomas C. Holloway, Memphis, who has been seriously ill with uremia, is reported to be improving.——Drs. Roy Granbery, Memphis, and Edwin W. Cocke, Whiteville, have been appointed assistant physicians to the Weston State Hospital, Bolivar.——Dr. Samuel E. Grout, physician to the Tennessee Coal, Iron and Railroad Company, at Bessemer, Ala., for several years, has resigned and will move to Dyersburg.

VIRGINIA

Health Department to Exhibit.—The Health Department of Richmond has decided to make an exhibit at the state fair. The exhibit includes graphic statements of the work accomplished by the department, the attitude of the department regarding small-pox and lessons in infant feeding.

Plan to Establish Temporary Trachoma Hospital.—Following the survey of Dickinson, Buchanan and nearby counties, which showed the prevalence of trachoma in the mountain sections, the State Board of Health and the United States Public Health Service have planned to cooperate to open a temporary hospital for the free treatment of trachoma, the United States government supplying surgeons, the State Board of Health to bear part of the expense and the building to be supplied by local authorities.

WEST VIRGINIA

Defer Work on Hospital Addition Till Spring.—The work on the new tuberculosis ward which is to be added to the State Penitentiary Hospital, Moundsville, and for which $7,000 was appropriated, will not, it is announced, be commenced until spring.

Personal.—Dr. Andrew J. Noome, Wheeling, who was run down by an automobile October 10, is reported to be improving.——Dr. Ulysses M. Carwell, Hendricks, is reported to be ill at his home with tetanus due to an accidental gunshot wound of the ankle.

WISCONSIN

Deserved Honor to Dr. Sheldon.—The physicians of Wisconsin, on the last day of the state society meeting in October, made a formal presentation to Dr. Charles S. Sheldon, Madison, retiring president and for many years secretary of the society. The address was made by Dr. Gilbert E. Seaman, Milwaukee, who expressed the love and reverence in which Dr. Sheldon is held in the medical profession of the state.

Specialists Meet.—The first annual state meeting of the Wisconsin eye, ear, nose and throat specialists, was held at Atheron Hotel and St. Mary's Hospital, Oshkosh, October 8 and 9, under the auspices of the Milwaukee Oto-Ophthalmic Society. Forty-five members were present and the program consisted of a scientific program on the first day and a clinic and operations at St. Mary's Hospital on the second day.

CANADA

Hospital News.—The Sisters of St. Joseph at St. Thomas, Ontario, have purchased 5 acres of ground and the residence of Mr. John Farley, K. C., which will be remodeled into a hospital and sanitarium.

Personal.—Dr. Charles A. Hodgetts, Ottawa, medical advisor to the Canadian Conservation Commission, has been appointed commissioner for the Canadian Red Cross Society in Britain, to succeed the late Colonel Burland of Montreal.——Word has been received in Quebec that Hon. Dr. Beland, who was voluntarily attending Belgian wounded in hospital at Antwerp, is now in safety in Holland.

Famine in Labrador.—It is reported that on account of the short catch of cod during the season, the fishermen of Labrador are already suffering from lack of proper food. Beriberi has already appeared on the coast. Dr. John Mason Little, Jr., in charge of the Grenfell Hospital, St. Anthony, N. F., attributes the situation to the fact that the fishermen in every case eat little except white flour bread during the winter.

Children's Hospital, Toronto.—The Toronto Board of Health has recommended that the city of Toronto pay the Hospital for Sick Children 32 cents a day for all indigent outpatients treated at the hospital. The per capita cost of treating such patients in the past year has been to the hospital 42½ cents per day. During the past hospital year 31,970 patients received treatment at a cost of $31,630.40; and the hospital authorities stated that unless the city undertook the major portion of this burden the trustees of the hospital would be compelled to discontinue the outpatient departments. The Ontario government has promised to make a grant of 10 cents per head for such patients. Last year the hospital had a deficiency of $18,892.57. The new grant will cost the city about $10,000 per annum.

Medical Inspection of Schools in Ontario.—The education department of the province of Ontario has issued in book form a new code of regulations for the medical inspection of schools. Provision is made whereby school boards may undertake free medical treatment of pupils whose parents are unable to pay; and school boards may appoint a school medical inspection committee representing one or several conjoint boards. This committee must appoint a qualified medical inspector of not less than two years' experience in his profession; and power is given with the consent of the minister of education and the provincial secretary for the Ontario Board of Health to name the municipal health officer as this medical officer for inspection. Nurses are also to be employed of one or more year's experience. Medical inspectors and nurses are to be subject to the ordinary school inspector or principal. This act makes medical inspection compulsory in rural school sections once every three months, in villages once a month, in towns once every two weeks, and in cities once a week. A complete physical examination must be made of every pupil as soon after admittance to school as possible. The school medical officer will also be required to confer with school boards on sanitary matters.

GENERAL

General Medical Directors Elect Officers.—At the annual meeting of the medical section of the American Life Convention, held in Dallas, Texas, October 7, the following officers were elected: chairman, Dr. Whitefield Harral, Dallas; vice-chairman, Dr. Frank W. Foxworthy, Indianapolis; secretary, Dr. Frank L. B. Jenney, Chicago (reelected), and member of the board of governors, Dr. J. P. Turner, Raleigh, N. C.

Railway Surgeons Elect Officers.—At the eleventh annual meeting of the American Association of Railway Surgeons held in Chicago, October 14 to 16, the following officers were elected: president, Dr. George F. Beasley, Lafayette, Ind.; vice-presidents, Drs. John P. Kaster, Topeka, Kan.; Clarence E. Case, Ashtabula, Ohio, and Eben N. Allen, Little Rock, Ark.; secretary and editor, Dr. Louis J. Mitchell, Chicago (reelected), and treasurer, Dr. Henry B. Jennings, Council Bluffs, Iowa. Safety first was the dominant note of the meeting.

Bequests and Donations.—The following bequests and donations have recently been reported:

Middlesex East District (Mass.), Medical Society, one fortieth of the residuary estate of Dr. John M. Harlow, Wilbur, amounting to about $4,000, to be held in trust, invested and the net income used toward paying the expenses of the society including the annual dinner.

St. Vincent's Hospital, Sanatorium Gabriel, Seton Hospital and the Society for the Relief of Incurable Cancer, all of New York City, each $5,000, by the will of Francis Higgins.

Presbyterian Hospital, for its Cathcart Home for Incurables, Devon, Pa., $6,000; Philadelphia Lying-in Hospital; and Philadelphia Home for Incurables, each one-ninth of the residuary estate of the late Francis T. Sully Darley.

To organize a corporation to maintain a hospital in Upland or Chester, $200,000, to pay the income and maintain a bed in the Woman's Hospital, Philadelphia, $5,000, and to maintain a bed in the Philadelphia Home for Incurables, $5,000, by the will of Robert H. Crozer.

Goldsboro, N. C., Hospital, $1,000, University of North Carolina, $1,000, and Jewish Orphanage of North Carolina, $2,500, by the will of Solomon Weill, Goldsboro, N. C.

Commemoration Day at San Francisco.—At the Atlantic City meeting the House of Delegates of the American Medical Association considered the recommendation of the Committee on Mode of Commemorating the Completion of the Panama Canal, to the effect that a day be set aside during the annual session at San Francisco next June to commemorate "the services of the men living or dead whose contributions to sanitary science and preventive medicine have made possible the construction of the Canal." The matter was referred to the Board of Trustees, which, at its meeting last week, October 23, adopted a resolution setting aside Wednesday (June 23) of the week of the annual session in San Francisco, for this commemoration day, and appointed a committee to make the necessary arrangements. The following is the committee: Dr. W. T. Councilman, Chairman of the Board of Trustees; Dr. Victor C. Vaughan, President of the American Medical Association; Dr. William L. Rodman, President-Elect, and Dr. George H. Simmons.

WAR NOTES

Chloroform Donations.—A donation of $4,000 worth of chloroform has been received by the British Red Cross from an American donor.

American Hospital in Petrograd.—The American colony in Petrograd has just established a small hospital there and the American Red Cross is arranging to send it absorbent cotton, linens, blankets, etc.

Dining Cars Placed at the Service of the Wounded.—The company owning the dining car service in Germany has placed all their cars at the service of the troops so that the wounded can be given warm food en route.

Motor Ambulances.—The British Red Cross Society has already been promised 200 motor cars to be used as ambulances. The Sydney branch of the society has sent a donation of $25,000, of which $5,000 is allotted for ambulances.

Cholera.—The Berlin exchanges of October 4 state that a single case of cholera has been discovered at Brunn, in a soldier returning from the seat of war in the northeast, and isolated at once. Two similar imported cases have been recognized and isolated at Vienna and one at Prague.

French Physicians at Erfurt.—Seven French physicians are said to be at work in the prisoners' camp at Erfurt, Germany, but in accordance with the Geneva convention, they are not regarded as prisoners of war but are lodged in the barracks and allowed to go about at will. They still wear their French uniforms with the Red Cross band on the arm.

Death of Professor König in the Field.—The *Med. Klinik* brings word that the professor of surgery at the university of Marburg, Friedrich König, was killed recently while attending to the wounded on one of the battlefields at the eastern seat of war. He was the son of the late Professor Franz König of Berlin, and entered on the practice of his profession in 1890.

No More Surgeons and Physicians Needed in the War Zone.—The First Aid Department of the American Red Cross announces that it has on file 2,000 applications from reputable American physicians and surgeons in the European war zone. These are far more than can be utilized at present. It is suggested, therefore, that no more applications be submitted at present.

The Iron Cross for German Members of the Profession.—The iron cross for special bravery under action has been conferred on Kraus, Martens, Jolly and Hübener, all of Berlin, Sauerbruch of Zurich, now consulting surgeon of the fifteenth army corps, Drigalski of Halle, Jüttner, Kirschner and Wachsen. The son of the latter is in the regular army and has likewise received the iron cross. Other recipients are: Guttmann, Gralow, M. Mendelssohn, Vormann, Rhode and Langheld; the latter was in the campaign in China.

French Wounded.—In the *British Medical Journal* for October 17, there is reprinted a portion of a letter written by Dr. Alexis Carrel, from Lyons. Dr. Carrel states:

"I am in my own city. Mobilized, naturally. I am in the Hotel-Dieu in the Department of Surgery. I have more than a thousand wounded to look after. My patients are the first who came under fire. They are those who in Haute Alsace completed with the bayonet the work of the mitrailleuse. Fortunately the wounds are not very serious. In all, the wounded in Lyons are about 12,000, distributed among forty-two hospitals; in the district there are 25,000 more. Having regard to the tremendous number of combatants, the number of wounded up to the present is not, so far as our army is concerned, very heavy, and the mortality is very low. In my hospital of 2,000 men hardly 20 have died of their wounds. Besides, our wounded go back in great numbers to the front, and thus our army goes on acquiring as time goes on soldiers who know what taking cover under fire means."

Protest Against Repudiation of Scientific Honors.—The senior of the medical faculty of the University of Berlin, Professor Waldeyer, has published a protest against the action of Roentgen, Behring and other German scientists in repudiating honors that had been conferred on them by scientific societies in Great Britain. He deplores their carrying the war into fields whose cultivation requires the concerted action and tranquil cooperation of all civilized peoples. This

repudiation of honors conferred for scientific work done in time of peace does not seem to him right, and it is superfluous besides, he says, as all German scientists who are able to bear arms are at the front. This surely is strife enough. Besides, the repudiation will make but little impression amid the thunder of war. One's love for his fatherland and one's sense of honor can be satisfied better and more effectually in other ways. Other scientists have subscribed to his view, including Orth and A. Martin. On the other hand, still more scientists are publishing their repudiation of honorary membership in British, French and Russian scientific societies.

Supplies Needed in the War Zone of Europe.—The American Red Cross announces the following articles as specially needed for wounded soldiers and sailors in hospitals. All garmenfs should be new: outing flannel pajamas and nightshirts, size 17; convalescent gowns, like bathrobes, of outing flannel or warmer material; socks, underwear and ward slippers. Acceptable hospital supplies or pillowslips and sheets, single size only; rubber sheets, 54 inches wide, and towels. The following articles of clothing, which must be absolutely new, are needed for the homeless and destitute women and children in the war zone: woolen blouses, warm shirts, boots and shoes, stockings, untrimmed cotton chemises, knitted mufflers or scarfs to cover the head and shoulders and especially shawls knitted or woven, made of woolen material and large enough to cover the body and shoulders as well as the head; petticoats, simple warm dresses for children and knitted hoods with long ends to throw around the neck or short capes to cover the shoulders. Presents of yarn and knitting needles also would be acceptable. All donations of clothing should be sent to the following address and the contents of each package should be plainly written on the outside: American Red Cross, care Bush Terminal Company, Thirty-Ninth Street and Second Avenue, Brooklyn, N. Y. Shipments of hospital supplies are to be sent in a few days to Germany via Rotterdam to Petrograd and to Paris. The supplies requested for Petrograd include chloroform, opium, cocain, disinfectants and absorbent cotton. An appeal from France is for more starched gauze, absorbent cotton, iodin and blankets.

LONDON LETTER

London, Oct. 16, 1914.

The War

The British army fighting in France and Belgium is only an instalment of a much greater force which is being prepared. It has already been increased by Indian and colonial troops. Its growth involves corresponding increase in the medical service. The authorities have therefore decided to duplicate the office of Director General of the Army Medical Service. Sir Alfred Keogh, who was Director General from 1904 to 1909—a post which he attained not by seniority but by his reputation as an administrator—will be in charge of the office of Director General at home. Until recently he has been chief commissioner of the British Red Cross in France. Sir Arthur Sloggett will become Director General of the expeditionary force. This decision has been reached partly because of the enormous amount of work connected with the expeditionary force, on the one hand, and the home force of new recruits on the other, and partly because it is thought that the director in this country should have had personal experience of the local conditions with the expeditionary force, which Sir Alfred Keogh has. Sir Arthur Sloggett has been appointed chief commissioner in France both of the Red Cross and the St. John Ambulance Association. He will thus be able to coordinate the work of these two voluntary organizations with that of the Army Medical Corps. For these two organizations a fund has been raised by the *Times* and now amounts to nearly $2,000,000. A special appeal has been made for motor ambulances, of which 200 have been provided out of 400 asked for. Many owners are giving their private cars, which can be converted into an ambulance at a cost of about $200. A great advantage of the motor ambulance is that severe cases which cannot wait for conveyance to hospital by train and endure the often long and slow journey may be at once removed by car. The condition of the wounded brought back to this country is most satisfactory; their dressings are in a most cleanly condition and considerably less than 10 per cent. of the wounds are suppurated—a most satisfactory result considering the large proportion of shrapnel injuries. In many cases rapid healing has taken place. During the transport every possible opportunity is taken to change the dressings.

APPOINTMENT OF CONSULTING PHYSICIANS

In my last letter I announced the appointment of two eminent surgeons with previous military experience as consultants for the army in the field. Three consulting physicians have now been appointed—Sir John Rose Bradford, physician to University College Hospital, Sir Wilmot Herringham, physician to St. Bartholomew's Hospital, and Sir Almroth Wright, director of the Department of Therapeutic Inoculation, St. Mary's Hospital, London. They will have the rank of colonel with its pay and allowances and will be accompanied by three expert bacteriologists. The appointment of Sir Almroth Wright, who is the pioneer of modern vaccine therapy in general and of antityphoid inoculation in particular, shows that this branch of preventive medicine will receive ample attention in the field. It has been decided to appoint a special army sanitary committee to advise the army council on all matters connected with the health of the troops at home and abroad. It will be a mixed committee, presided over probably by a general officer of the engineers and comprising officers of the Army Medical Corps, and members of the civilian public health service.

ANTITYPHOID INOCULATION

Antityphoid inoculation is being performed on a large scale on troops about to leave for the front, but in keeping with the spirit of freedom of this country it is not compulsory. The following is the procedure adopted: The men are advised to take no alcohol for twelve hours before and twenty-four hours after inoculation. The men are paraded, and six of them are admitted into the room at once; a noncommissioned officer paints over a small area about 1 inch below the center of the left clavicle; the men then sit down on a seat beside a table on which a small sterilizer is kept boiling; three syringes are used. An assistant, not a physician, puts the syringe and needle into the sterilizer as it is used, and continues using the same needle until it becomes blunt; as a rule one needle is good for about fifty or sixty punctures. After inoculation the puncture is sponged and pressed with a small antiseptic pad, and only in very rare cases does any bleeding occur. It is found that making the injection in the breast causes much less discomfort and pain to the men. They are all right for duty in about twelve hours, with the exception of a few who may be off duty for two or three days. The second dose is given about ten days afterward in the right breast. Working in this way, about seventy to eighty can be done in an hour.

THE BELGIAN REFUGEES

The flood of refugees from Belgium to this country has increased since the capture of Antwerp, which was followed by a total exodus of the population. Many sought the friendly refuge of Holland, whence they were invited to return by the Germans. The large and fashionable seaside resort of Folkestone is the principal place of landing in this country and is given up almost entirely to Belgian refugees. As many as 10,000 have landed in the day and the total number in this country now exceeds 100,000. The destitute condition is most pathetic. Many, including a large number of children, are starving and some have been so long without food that they have to be treated medically before they can take it. A large number of wounded Belgian soldiers have also been landed and removed to various hospitals. As many as 8,000 arrived in two days. Numerous Red Cross workers, voluntary helpers and interpreters minister to the wants of the refugees and convey them to the homes which private and public beneficence have abundantly prepared for these innocent victims. After resting for a few days the refugees are drafted to homes prepared for them in London and various parts of the country.

PARIS LETTER

Paris, Oct. 8, 1914.

Antitetanus and Antidysentery Serums

The minister of war has just forbidden the Pasteur Institute to deliver any dose of antitetanic or antidysenteric serum since the whole supply of these serums should be centralized in the war department.

Resumption of Courses at the University of Paris

The council of the Université de Paris met October 1 and made all arrangements for beginning courses in the various departments at the usual date. The council decided that at the end of hostilities special examinations should be held in all the departments for the benefit of the students whose

service under the colors prevents them from being present at the ordinary October and November sessions and that all possible facilities be extended to them.

Swiss Physicians and the Wounded

One of the most eminent Swiss surgeons, Dr. César Roux, professor of clinical surgery at the Faculté de médecine de Lausanne, has just set out for Besançon to offer his services to the hospitals in that city. The population of Switzerland shows a great desire to ameliorate the distresses of the war. A wish has been expressed that Swiss ambulances should be sent to the scenes of war. The head physician of the Swiss Red Cross replies that it is not certain that Switzerland may not need all her medical resources if only in the case that it is necessary to interne foreign troops. The belligerent countries, moreover, have not requested, either directly or indirectly, the sending of ambulances.

The Improvement of the Conditions of the Transportation of the Wounded

The character of modern battles, which last for weeks, creates great difficulties in the transportation of the wounded. Removed incessantly from litters to carriages, from carriages to ambulances, from ambulances to wagons, from wagons to hospitals, laid on straw where hundreds of their comrades have lain, soiling their couches with dust, mud, blood and pus, these unfortunates at each stage run the risk, if not of infection, for most of them are infected already, at least of additional infection or of contracting some new infection which they might have escaped. One of the prime conditions of the safety of the wounded is the avoidance of contact with soiled straw and too numerous changes of position. Dr. Mosny, member of the Académie de médecine, recommends the use of strong washable canvas cases that can be filled with straw. At each corner of these mattresses, a long ear for convenience in handling permits the wounded man to be lifted from the litter to the carriage, wagon, ambulance or hospital without painful or dangerous shifting of position. A removable oilcloth would prevent the soiling of the mattress. A pillow-case, stuffed with hay or straw, under the head of the wounded man, would add to his comfort and allow him to eat or drink without sitting up or raising his head. The mattress case, oilcloth and pillow-case are easy to disinfect. In most cases, the oilcloth alone, which would be in immediate contact with the wounded man, would need disinfection after use. This improvement of the conditions of transportation of the wounded would be easy, rapid and inexpensive to effect. The Union des femmes de France, which has already furnished some ambulances with such mattresses and pillow-cases, has undertaken to supply them.

Measures of Public Hygiene

The prefect of police has just sent to the mayors of the communes around Paris a circular containing various recommendations for the preservation of the public health. In regard to drinking-water, the circular recommends some simple procedures for the economical purification of water. The first is boiling. The second is to pour in fifteen or twenty drops of fresh iodin tincture per liter of water and after a quarter of an hour to add two or three little crystals of sodium hyposulphite and to agitate until decoloration is complete. The third is to dissolve crystals of potassium permanganate one by one in the water to be purified until the water is colored slightly pink. If the tint is too pronounced a little sugar is to be added. The prefect emphasizes the necessity of thoroughly cleaning and disinfecting buildings which have sheltered troops and of taking the greatest pains to see that such buildings and those housing sick or wounded soldiers are kept perfectly neat.

Abuse of the Red Cross Insignia

It has been remarked that persons having no connection with our sanitary organizations wear the costume of ambulance attendants in public, especially at the railway stations through which trains bearing the wounded are passing. Such abuses are liable to harm the prestige of the Red Cross societies. The prefect of the police, therefore, has resolved to prosecute, in conformity with the law, every unauthorized use of the Red Cross brassard. The agents of the municipal police have received the order to demand authenticated proofs of identity, especially at the railway stations.

The Red Cross Stamp

To secure resources for the societies for the aid of the wounded, it has been decided to print a special postage stamp of 15 centimes' (3 cents) value of which 10 centimes are to go to the post-office, the remaining 5 centimes being shared among the Red Cross societies. The post-office immediately printed temporary stamps by printing on the usual 10-centime stamps a red cross and charging 5 centimes additional for them. At present, the 15-centime stamp is on sale throughout France at all post-offices and tobacco shops. The stamp, the use of which is, of course, optional, is good only for use within France.

An Offer from the University College of London

The Université de Paris has received from Mr. T. Gregory Foster, provost and president of the faculty of the University College of London, a letter offering the assistance of the University College to male or female students from Paris who wish to come to London to resume their studies. The members of the faculty offer hospitality to about sixty members of the Université de Paris, professors, teachers or students, whose present situation places them in need of such assistance.

American Assistance for France

The New York Committee directed by Mrs. Whitney Warren and Mrs. Robert Bacon has cabled 50,000 francs ($10,000) to the Committee France-Amérique. This sum, raised by private subscriptions in the United States, will be turned over to the committee of national assistance presided over by M. Appell, dean of the Faculté des Sciences de Paris.

The minister of war has been authorized to accept in the name of the government a gift of 500,000 francs ($100,000) given by the Canadian government. The sum will be used for the organization and maintenance of a temporary hospital for sick and wounded soldiers which will be called the Hospice Canadien.

Marriages

WILLIAM P. STUART KEATING, M.D., Willimantic, Conn., to Miss Elsie W. Greene of Matteawan, N. Y., at Willimantic, October 12.

CHARLES CORR GANS, M.D., Point Marion, Pa., to Chelsea Trax Carroll of Uniontown, Pa., at Jacksonville, Fla., September 15.

FREDERICK WILLIAM WITTICH, M.D., Westminster, B. C., to Miss Jean Wetterán of Hazelton, Pa., at Westminster, October 24.

GROVER CLEVELAND OTRICH, M.D., Belleville, Ill., to Mrs. Margaret Zimmerman of Kansas City, Mo., at Chicago, October 14.

LAWRASON BROWN, M.D., Saranac Lake, N. Y., to Miss Martha Lewis Harris of Baltimore, at Midland, Va., October 8.

PASSED ASSISTANT SURGEON HARRY E. JENKINS, U. S. N., to Miss Harriet Whiting Gatewood of Washington, D. C., October 7.

ISAAC DONALDSON RAWLINGS, M.D., Chicago, to Miss Eleanor Florence Cupp of Stevensville, Mich., October 17.

RUTHERFORD B. HAYES GRADWOHL, M.D., to Mrs. John E. Holman, both of St. Louis, at Manchester, Kan., July 12.

BURNS RUSH EASTMAN, M.D., Muskegon, Mich., to Miss Frances M. Scriver of Westmont, Montreal, August 6.

GEORGE M. FLANAGAN, M.D., New Britain, Conn., to Miss Mary E. Swartwood of Syracuse, N. Y., October 12.

LEE VILEY WILLIAMS, M.D., Lexington, Ky., to Miss Margaret Clark Steele of Nicholasville, Ky., October 12.

FREDERICK WILLARD BRIAN, M.D., Bloomington, Ill., to Miss Virginia Hillabold of Syracuse, Ind., October 15.

CHARLES B. BARKER, M.D., to PAULINE QUILLIN, M.D., both of Guthrie, Okla., at Oklahoma City, October 17.

CYRUS WHITNEY CULVER, M.D., Lowville, N. Y., to Miss Florence Mary Galley of Montreal, October 10.

ARTHUR MCCAREY, M.D., Chicago, to Miss Arleen Winnifred Joannes of Green Bay, Wis., October 1.

SETH BILLINGTON SPRAGUE, M.D., to Miss Mildred A Miller, both of Jersey City, N. J., recently.

WILLARD K. CLARK, M.D., Niobrara, Neb., to Miss Eunice Cornell, at Auburn, Neb., September 23.

ELMER E. GARRETT, M.D., to Miss Lena M. Floyd, both of Troy, Ia., at Bloomfield, Ia., October 6.

Deaths

John N. McCutchan, M.D. Louisville Medical College, 1896; a member and councilor of the State Medical Association of Texas; of Waco, Tex.; formerly president of the Central Texas District Medical Association and secretary of the Bell County Medical Society; health officer of Bell County and the city of Temple; assistant medical director of the Amicable Life Insurance Medical Association, Waco; died in the Providence Sanitarium in that city, October 9, from disease of the kidney for which an operation had been performed a week before, aged 41. At a meeting of the McLennan County Medical Society, October 10, resolutions of regret and sympathy were adopted.

John W. Morris, M.D. Albany (N. Y.) Medical College, 1881; attending consulting physician to the House of the Good Shepherd and physician to the Marshall Infirmary, Troy, N. Y.; for more than thirty years a practitioner of that city and once city physician and police surgeon; died at his home October 5, from angina pectoris, aged 55. At a special meeting of the Rensselaer County Medical Society, October 7, eulogistic addresses were delivered and resolutions of respect and regret were adopted.

Ernest J. Waddey, M.D. University of Maryland, Baltimore, 1891; of Waterloo, Ia., a Fellow of the American Medical Association; a charter member of the Waterloo Medical Society, and once president of the Black Hawk County Medical Society; district surgeon of the Illinois Central System and a member of the board of commissioners of insanity of Black Hawk County; died in St. Francis' Hospital, Waterloo, October 14, from organic nervous disease, aged 47.

William James Lumsden, M.D. University of Maryland, Baltimore, 1869; a Fellow of the American Medical Association; a Confederate veteran; formerly secretary of the Medical Association of the State of North Carolina; for more than forty years a practitioner of Elizabeth City, N. C.; one of the most beloved physicians of eastern North Carolina; died at his home, October 14, from cerebral hemorrhage, aged 68.

Leon Gay Lewis, M.D. Hahnemann Medical College, Chicago, 1910; of Milwaukee; formerly a member of the staff of the Ernest Wende Hospital, Buffalo, N. Y.; recently appointed a member of the house staff of the National Soldier's Home in Dayton, Ohio; died in Good Samaritan Hospital, Milwaukee, September 29, from typhoid fever, aged 27.

Charles S. Rudolph Reed, M.D. College of Physicians and Surgeons in the City of New York, 1879; of Utica, N. Y.; a specialist on diseases of the eye, ear, nose and throat; for twelve years consulting surgeon in his specialties in St. Elizabeth's Hospital, Utica; died in that institution, two days after a surgical operation, aged 62.

Arthur C. Magill, M.D. Michigan College of Medicine, Detroit, 1885; a member of the Medical Society of the State of Pennsylvania, and a practitioner of Pittsburgh, Pa.; once a member of the city council of Pittsburgh and board of trustees of the Carnegie Library; died in St. Francis' Hospital, Pittsburgh, October 17, aged 52.

James H. Walker, M.D. Iowa State University, Iowa City, 1898; a Fellow of the American Medical Association; once president of the Central District (Iowa) Medical Association and coroner of Boone County; one of the best known physicians of central Iowa; died at his home in Boone, September 25, from malignant disease, aged 44.

James S. Fuller, M.D. Kansas City (Mo.) Medical College, 1898; of Fort Gibson, Okla.; a member of the Oklahoma State Medical Association and a charter member of the Muskogee County Medical Society; died in Muskogee, August 30, from disease of the gall bladder and adnexa.

Veda C. Chipperfield Murphy, M.D. College of Physicians and Surgeons, Chicago, 1904; a Fellow of the American Medical Association and one of the most prominent woman physicians of Fulton County, Ill.; died at her home in Cuba, Ill., October 13, from carcinoma, aged 40.

Robert White, M.D. Durham (England) University, 1843; M.R.C.S., Eng., 1843; for forty-six years a practitioner of Boston; a member of the Massachusetts Medical Society; died at his home in Cambridge, Mass., September 27, aged 91.

H. C. Ferguson, M.D. Cincinnati College of Medicine and Surgery, 1876; a physician and pharmacist of Carter, Ky.; was found dead at the home of his son in Portsmouth, Ohio, October 6, aged 73.

Henry R. Stout, M.D. Hahnemann Medical College, Chicago, 1868; president of the Homeopathic Board of Medical Examiners of Florida; for forty-two years a practitioner of Jacksonville, Fla.; died at the home of his daughter in St. Augustine, Fla., October 14, aged 71.

John C. Amis, M.D. University of Louisville, Ky., 1883; a Fellow of the American Medical Association; attending physician to the Bell Point Hospital and physician-in-chief to the Fort Smith Orphan's Home; died at his home in Fort Smith, Ark., October 14, aged 54.

William B. Walker, M.D. Cincinnati College of Medicine and Surgery, 1876; a member of the Medical Society of the State of Pennsylvania and formerly vice-president of the Indiana County Medical Society; died at his home in Dayton, Pa., September 19, aged 63.

Richard Lee Smith, M.D. Beaumont Hospital Medical College, St. Louis, 1896; formerly mayor of Washougal, Wash.; died in his office in that place, September 12, from the effects of a gunshot wound of the head self-inflicted, it is believed with suicidal intent, aged 50.

Linwood Shangar Corson, M.D. Temple University, Philadelphia, 1907; chief of the Medical Dispensary of the Garrettson Hospital; a practitioner of Glenmoore, Pa.; died in the Samaritan Hospital, Philadelphia, September 26, from heart disease, aged 41.

Joseph Edward Beatty, M.D. University of Maryland, Baltimore, 1861; for forty years a practitioner of Baltimore; surgeon major of the Second Maryland Volunteer Infantry during the Civil War; died in a sanatorium near Baltimore, October 13, aged 75.

Christopher S. Newbill, M.D. College of Physicians and Surgeons, Baltimore, Md., 1875; for many years health officer of Norfolk, Va.; died suddenly September 26, from cerebral hemorrhage, while driving near his home in Tappahannock, Va., aged 63.

Nicholas Z. Wagener, M.D. Northwestern University Medical School, 1904; a member of the Wisconsin State Medical Society; of Sturgeon Bay, Wis.; died in a hospital in that city, October 3, a week after an operation for appendicitis, aged 41.

William R. Hamilton, M.D. New York University, New York City, 1864; a member of the Medical Society of the State of Pennsylvania, and one of the oldest practitioners of Pittsburgh; died at his home October 15, from senile debility, aged 86.

Josiah T. Payne, M.D. University of Maryland, Baltimore, 1868; a Confederate veteran and health officer of the Tenth District of Baltimore County, Md.; died at his home in Sunny Brook, Md., October 2, from cerebral hemorrhage, aged 75.

Collier D. East, M.D. College of Physicians and Surgeons, Baltimore, Md., 1876; a member of the South Carolina Medical Association, of Goldville, S. C.; died at the home of his sister in Clinton, S. C., September 20, from heart disease, aged 62.

James Bachelder Bell, M.D. Homeopathic Medical College of Pennsylvania, Philadelphia, 1869; for nearly thirty years a member of the staff of the Massachusetts Homeopathic Hospital; died at his home in Boston, September 27, aged 76.

Harry C. Wakefield, M.D. Beaumont Hospital Medical College, St. Louis, 1892; acting assistant surgeon, U. S. P. H. S., and on duty at the St. Louis Marine Hospital since 1895; died in that institution, October 6, from appendicitis, aged 44.

John Francis Dustin, M.D. National Medical University, Chicago, 1902; of Deadwood, S. Dak.; aged 54; died in St. Joseph's Hospital in that city, September 27, from injuries received sixteen hours before, by the overturning of his automobile.

Benjamin F. Wyman, M.D. Medical College of the State of South Carolina, Charleston, 1869; a practitioner of Aiken; died at the home of his granddaughter in Kitchings Mills, S. C.; September 30, from pneumonia, aged 75.

Charles M. Van Dyke, M.D. Starling Medical College, Columbus, Ohio, 1886; a member of the Medical Society of the State of New York; health officer for Milo; died at his home in Himrod, N. Y., September 29, aged 57.

Nathaniel G. Morris, M.D. University of Nashville, Tenn., 1873; a member of the Kentucky State Medical Association; of Fulton, Ky.; died suddenly at his farm near that place, September 25, from heart disease, aged 63.

Elijah Leonard Bruen, M.D. Long Island College Hospital, Brooklyn, 1899; a member of the medical staff of the Women's Hospital in the State of New York and the New York Polyclinic; died at his home in Brooklyn, October 3.

Gustav Burton Turner, M.D. Northwestern University, Chicago, 1912; assistant surgeon of the Western Pacific Railroad at San Francisco; died in Mount Sinai Hospital in that city, September 19, from diabetes, aged 27.

Henry S. Baron, M.D. Physio-Medical College of Indiana, Indianapolis, 1878; a Fellow of the American Medical Association; died at his home in Pella, Iowa, September 20, from carcinoma of the intestines, aged 62.

Max H. Hartwig, M.D. Detroit College of Medicine and Surgery, 1888; of Port Washington, Wis.; was instantly killed by the overturning of his automobile, 4 miles west of Port Washington, September 16, aged 49.

Andrew A. Forsythe, M.D. Tulane University, New Orleans, 1887; for nearly sixteen years mayor of Monroe, La.; died at his home in that city, September 29, from chronic interstitial nephritis, aged 52.

Carl Kaufman, M.D. University of Heidelburg, Germany, 1868; for several terms coroner of Sargent County, N. Dak.; died at his home in Gascoyne, N. Dak., about September 28, from cirrhosis of the liver, aged 70.

Aaron Robert Wolfe, M.D. New York University, New York City, 1882; of Paterson, N. J.; was thrown from his automobile September 26, by the simultaneous bursting of two tires, and instantly killed, aged 55.

James Singleton Shoemaker, M.D. Hahnemann Medical College, Philadelphia, 1888; a member of the teaching staff of his Alma Mater; died at his home in Philadelphia, October 7, from nephritis, aged 50.

Abner McLean, M.D. Medical College of the State of South Carolina, Charleston, 1861; surgeon in the Confederate service throughout the Civil War; died at his home in Dillon, S. C., October 1, aged 80.

Alfred J. Perkins, M.D. Eclectic Medical Institute, Cincinnati, 1865; at one time president of the Florida State Eclectic Medical Association; died at his home in Daytona, Fla., October 10, aged 80.

James A. Toole, M.D. Savannah, Georgia, Medical College, 1869; surgeon in the Confederate service during the Civil War; died at his home in Glenwood, near McRae, Ga., September 21, aged 73.

James W. Fergus, M.D. Memphis Hospital Medical College, Memphis, Tenn., 1891; a member of the Arkansas Medical Society; died at his home in Elm Springs, Ark., about September 17, aged 62.

Cassius Marcellus Smick, M.D. Miami Medical College, Cincinnati, 1881; a member of the medical staff of St. Luke's Hospital, Terre Haute, Ind.; died at his home in that city, September 12, aged 61.

Simon P. Lester, M.D. Jefferson Medical College, 1852; for more than sixty years a practitioner of Mississippi; died at his home in Batesville, September 28, from carcinoma of the stomach, aged 87.

Joseph Glass Wilson, M.D. College of Physicians and Surgeons, Keokuk, Ia., 1873; formerly of Attica, Kan.; died at his home in Portland, Ore., August 26, from valvular heart disease, aged 72.

Hugh Lagan, M.D. University of California, San Francisco, 1893; once surgeon of the San Francisco Fire Department; died at his home in San Francisco, October 13, from tuberculosis, aged 43.

Alonzo M. W. Westfall (license, years of practice, Illinois, 1877) a practitioner of Prairie City, Ill., for forty-four years; died at his home September 21, from acute dilatation of the heart, aged 70.

J. P. Swentzel (license, years of practice, West Virginia, 1881); for fifty-three years a practitioner of medicine; died at his home in Arnoldsburg, W. Va., early in August, aged 80.

Louise Dodson Holmes, M.D. Women's Medical College, of Cincinnati, Ohio, 1895; a member of the Massachusetts Medical Society; died at her home in Athol, Mass., recently, aged 46.

Horace K. Regar, M.D. University of Pennsylvania, Philadelphia, 1878; a Fellow of the American Medical Association; died at his home in Philadelphia, September 14, aged 59.

Andrew B. Brookins, M.D. University of Louisville, Ky., 1875; of Bartow, Fla.; formerly chief surgeon of the Hospital for Inebriates; died in Jacksonville, Fla., September 21, aged 81.

Isaac Newton Willard, M.D. Bellevue Hospital Medical College, New York City, 1875; of Utica, N. Y.; died suddenly in Syracuse, N. Y., September 25, from angina pectoris, aged 65.

Harriet E. Turner, M.D. Medical College of Indiana, Indianapolis, 1896; a Fellow of the American Medical Association; of Indianapolis; died in Boston, Mass., September 29, aged 49.

John Whiting Niles, M.D. New York University, New York City, 1876; for many years a practitioner of Chicago; died at his home in that city, October 17, from cerebral hemorrhage, aged 62.

Claudius H. Morris, M.D. Medical College of Indiana, Indianapolis, 1881; for twenty-five years a practitioner of Galveston, Tex.; died in San Antonio, Tex., October 7, aged 61.

Jedediah Marcus Barton, M.D. Hahnemann Medical College, Philadelphia, 1870; died at his home in Worcester, Mass., September 30, from cerebral hemorrhage, aged 69.

William E. Henderson, M.D. University of Louisville, Ky., 1873; a member of the Oklahoma State Medical Association; died at his home in Shawnee, Okla., October 11, aged 64.

John W. Layfield, M.D. University of the South, Sewance, Tenn., 1899; for several years a practitioner of Alma, Ga.; died at a hospital in Savannah, Ga., October 3, aged 40.

Harry Murray Jones, M.D. University of North Carolina, Chapel Hill and Raleigh, 1906; died at his home in Nez Perce, Idaho, October 5, from pneumonia, aged 33.

Samuel Hamilton Vredenburg (license, years of practice, Illinois, 1878) for nearly sixty years a practitioner of Danville, Ill.; died at his home, September 24, aged 94.

Jesse Portman Chesley, M.D. Washington University, St. Louis, 1864; of St. Joseph, Mo.; died at the home of his daughter in Kansas City, Mo., October 10, aged 81.

William Henry Davies, M.D. University of Edinburgh, Scotland, 1857; of Monterey, Cal.; died in San Francisco, September 30, from senile debility, aged 80.

Abram L. Small, M.D. Rush Medical College, 1863; a pioneer practitioner of Kankakee County, Ill.; died at his home in Kankakee, October 6, aged 84.

Herbert E. Bennett, M.D. Starling Medical College, Columbus, Ohio, 1879; died at his home in Mentone, Ind., September 28, from heart disease, aged 50.

David T. Hyatt, M.D. Louisville Medical College, 1874; a practitioner and druggist of Monticello, Ark.; died at his home recently, aged 62.

Honore P. Guilbeau, M.D. University of Pennsylvania, Philadelphia, 1853; died at his home in Breaux Bridge, La., September 27, aged 82.

Frank A. Hemenway (license, Iowa, practitioner, 1886); died at his home in Clio, Iowa, September 19, from disease of the lungs, aged 68.

John A. Hamilton (license, Ind., 1897); for thirty-five years a practitioner of Advance, Ind.; died at his home September 28, aged 78.

Harry David Belt, M.D. Medical College of Ohio, Cincinnati, 1867; died in Chicago, September 30, from cerebrospinal meningitis, aged 40.

David Lewis Taylor, M.D. Albany, N. Y. Medical College, 1892; of New York City; died in Gilbertsville, N. Y., July 11, aged 46.

Lafayette J. Poe, M.D. Eclectic Medical Institute, Cincinnati, 1876; died at his home in Butler, Ky., September 18, aged 67.

James Neil, M.D. New York University, New York City, 1850; died at his home in New York City, September 26, aged 86.

Josephine Alice Line, M.D. Rush Medical College, 1903; of Hiram, Ohio; died suddenly in Troy, Ohio, August 17, aged 37.

Alonzo G. Cook, M.D. Hahnemann Medical College, Chicago, 1881; died at his home in Long Beach, Cal., August 15, aged 75.

John L. Phillips (license, Ind., 1897); of Linton, Ind.; died in Ann Arbor, Mich., August 30, from gastritis, aged 74.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

THE "BIG SIX"

Six Reasons for the Perpetuation of the Proprietary Evil

"The Big Six" is the modest name assumed by the Associated Medical Publishers in describing the half-dozen medical journals that comprise their association. The Associated Medical Publishers is an organization evidently composed of the owners and publishers of the following journals:

American Journal of Clinical Medicine, Chicago: Essentially a house organ for the Abbott Alkaloidal Company. Was established in 1894, its original name being the *Alkaloidal Clinic*.

American Journal of Surgery, New York: Originally established in St. Louis, but when purchased by its present owner, was transferred to New York City. Its owner and managing editor was, previous to the time he purchased the *American Journal of Surgery*, advertising manager for another surgical journal. He still is, essentially, an advertising man, and is said to act as advertising director of a Massachusetts proprietary house.

American Medicine, Burlington, Vt.: Originally established as a weekly in Philadelphia. When purchased by its present owner, it was changed to a monthly, and the place of publication transferred to Burlington, Vt., although its principal offices are in New York City. Its present owner and managing editor conducts an advertising agency that handles a number of proprietary medicine accounts.

Interstate Medical Journal, St. Louis: Practically owned and controlled by a physician who conducts an advertising agency which handles, or has handled, a number of advertising accounts of proprietaries.

Medical Council, Philadelphia: Was established in 1895 and is at present owned and controlled by the widow of its founder.

Therapeutic Gazette, Detroit: Essentially a house organ for Parke, Davis & Company and is published by the general manager of this company.

The Associated Medical Publishers under the caption "Big Six" published the following advertisement early this year:

"A banner year is ahead for those firms who plan to develop the patronage and support of the medical profession for their products. Never were the opportunities greater, or the prospects brighter, for enlisting the aid of medical men in the successful merchandising of pure foods, sanitary supplies for the home, school or public institution, hygienic clothing and foot wear, automobiles and automobile accessories, and high grade specialties in general appealing to the physician personally, or in his professional capacity.

"Through the services of 'The Big Six' reputable firms can secure for products of established merit, the favorable attention of over 100,000 of the country's foremost physicians.

"Certainly no other way of reaching the physician is so effective and economical as the use of advertising space in these recognized high-class journals. Owing to their standing and the fact that medical men preserve them indefinitely for repeated reference, they give a sustained service that is possible by no other class of publications.

"If you have something of real merit to introduce to American doctors, do not fail to investigate 'The Big Six.' It has paid others and paid them well, it will pay you."

An advertisement for the *Interstate Medical Journal* says in part:

"Here is a journal for the busy, thinking men of the profession who demand authoritative and timely journalistic service."

And the publishers of the *American Journal of Clinical Medicine:*

"*Clinical Medicine* is the great therapeutic journal. It is not intended for specialists and theorists. It is intended for general practitioners. Every number, every page, every line is selected with that point in view, to give you all the help we possible can. You need it, let us show you why."

The owners of the *Therapeutic Gazette* tell the medical profession that they regard each subscription as a contract with the physician to furnish him monthly with 76 pages of the most reliable information that can possibly be collected on the subject of therapeutics.

"Guarding your rights along these lines as carefully as we do, we beg of you to read the announcements of our advertisers, and favor them with inquiries and requests for samples; and when so doing, please be so kind as to mention having seen the advertisement in the *Therapeutic Gazette*."

Of the *Medical Council*, we learn that:

"Its pages are filled with scientific material of that brief concise, practical character so easily assimilated and so very helpful in the physician's every day work. Especial attention is devoted to the business side of the physician's life. To the busiest, most prosperous physicians *Medical Council* has become indispensable. . . . No journal in America is more conscientious concerning the character of its advertising pages than *Medical Council*."

SOME NOSTRUMS ADVERTISED IN THE "BIG SIX"

NOSTRUMS	*Therapeutic Gazette*	*American Medicine*	*American Journal of Clinical Medicine*	*Interstate Medical Journal*	*Medical Council*	*American Journal of Surgery*
Aletris Cordial		+		+	+	+
Anasarcin	+	+	+	+	+	+
Angier's Petroleum Emulsion		+		+	+	
Antiphlogistine	+	+		+	+	+
Betul-Oil	+	+				+
Bromidia	+		+			
Burnham's Soluble Iodine		+	+	+	+	+
Cactina Pillets	+	+		+	+	+
Campho-Phenique	+	+			+	+
Celerina		+		+	+	+
Chionia	+	+		+	+	+
Citrolax	+	+	+		+	+
Colchi-Sal	+	+				+
Crotalin			+	+		
Cystogen Aperient	+	+	+	+	+	+
Dermatone	+		+			
Dioviburnia			+		+	
Ergoapiol	+	+	+	+	+	+
Fellows' Syrup of the Hypophosphites	+	+	+	+	+	+
Formamint		+				+
Gastrogen Tablets	+	+			+	
Glyco-Heroin	+	+	+	+	+	+
Glyco-Thymoline	+	+	+	+	+	+
Gray's Glycerine Tonic	+	+	+	+	+	+
H-M-C (Abbott)	+	+	+	+		
Hayden's Viburnum Compound	+	+	+	+	+	+
Micajah's Wafers	+			+		+
Neurosine	+	+	+	+	+	+
Noitol			+			
Palpebrine			+		+	
Papine	+		+			
Pasadyne	+					
Peacock's Bromides	+	+		+	+	+
Pepto-Mangan (Gude)	+	+	+	+	+	+
Phenalgin	+	+	+	+		+
Protonuclein and Protonuclein Beta				+	+	+
Prunoids	+	+		+	+	+
Resinol	+			+		
Respirazone				+	+	+
Sanmetto		+				
Secretogen					+	
Sedobrol Roche	+		+	+	+	
Seng	+	+		+		+
Three Chlorides (Henry)		+		+		+
Tri-Iodides (Henry)		+		+		+
Trophonine					+	
Unguentine			+	+	+	+

In fairness to the *Medical Council* it should be said that this publication has, during the past six or eight months, purged its advertising pages of many of the more objectionable products. It is understood that further deletions are under consideration.

How careful the owners and editors of the "Big Six" journals are to present authoritative information in their advertising pages is evidenced by the accompanying list showing some of the medicinal articles advertised in recent, 1914, numbers of these six ostensibly high-principled medical journals. Many of the articles included in this list can safely be classed with the more obnoxious nostrums of the "patent

medicine" type and like the latter class are, in many instances, simple frauds, the sale of which should not be tolerated.

How closely the method of advertising these several preparations simulates that adopted by the manufacturers of "patent medicines" is evidenced by the fact that within the past year the assertions made in many of the advertisements have materially changed and the statement that the preparation is "an efficient remedy" in place of "a positive cure" is now generally used. To be somewhat more impressive the manufacturers frequently utilize the assertion that their preparation "seems to exert an almost specific effect" or the equally misleading statement, "no remedy at the command of the profession is more valuable than" the preparation under discussion. Not infrequently the advertiser also adds the additional promise that his preparation "will not disappoint you."

A careful study of the accompanying list ought to convince the thoughtful practitioner that many if not all of the nostrums advertised in these several journals are fully as objectionable as those advertised in the daily press and will further convey the rather sorrowful conviction that until a distinct majority of the "100,000 of the country's foremost physicians," who are said to be subscribers to these journals, will devote themselves to the best that is in their profession, we have little or no right to expect that the public at large will believe us to be less gullible than the most unsophisticated layman or that our opinion regarding any one nostrum is not influenced by our interest, direct or indirect, in one or more of the other secret or semi-secret preparations that are equally bad.

WHAT ONE PAPER THINKS OF THE "ASSOCIATED DOCTORS"

There is published in York, Neb., a "live" newspaper, the *New Teller*. We have referred to this paper before[1] and to the open letter it published declining an advertisement offered by a Kansas City quack. The *New Teller* of Oct. 14, 1914, publishes another open letter, this time to an advertising agency. The agency wrote to the York paper stating that it had recently sent the *New Teller* an advertisement of the "Associated Doctors" but had failed to receive marked copies of those issues of the paper that should have contained these advertisements. It asked that the *New Teller* please forward the issues containing the advertisements or state why it was not publishing them. The editor's reply begins:

"*Dear Dakota Advertising Agency:*—We have been answering inquiries similar to yours, from various parts of the country, with an admirable patience for several years past. In this instance we have decided to come back with a few inquiries of our own.

"Who are the Associated Doctors? Are they associated with anybody but each other? . . . Are they associated with any reputable medical institution anywhere, or endorsed by any resident physician of standing that you know of? Do you believe they are really capable of performing miraculous cures, or that they would have time enough to travel around the country if they could accomplish such cures? Wouldn't patients be flocking to them by the tens of thousands within a week after the first half dozen such cures?"

Then, after asking the advertising agency whether it would still handle the "Associated Doctors" advertising if it knew these "doctors" were fakes, the *New Teller* says:

"Here in this little town of York, a new $50,000 hospital is to be completed within the next few months. If the 'Associated Doctors,' with whom you appear to be associated can make good on only a small part of the promises you expect us to make for them, they needn't suffer all the inconveniences of constant traveling—of stopping at country hotels—of riding jerkwater trains—a moment longer. We'll make them the staff of our new hospital by unanimous consent, and they'll make York the most famous town in the world within thirty days after they take the job."

Then the editor relates an instance that had come to his notice of a "poor devil not living far from York" who was "afflicted with a disease pronounced incurable, in his case, by some of the most notable specialists in the country." The hopeless sufferer fell into the hands of quacks who "fed him a little dope" and, after getting his confidence, "promised to complete the cure for what, to him, was a tremendously large sum of money." The poor fellow raised the money, though he had to mortgage his team of horses to do it—and then the inevitable happened. The editor continues:

"A doctor who is not competent, or who is unreliable and dishonest can't stay in one town very long. If the Associated Doctors are what they pretend to be, they can stay in York as long as they like.

"Anyway, dear Dakota Advertising Agency, this newspaper never has and never knowingly will endorse these fly-by-night specialiars such as the United Doctors, Associated Doctors, or any Hoboe Doctors, by printing their promises for them. We believe such promises are lies, and we don't care to go into business with the people who tell them. Furthermore, dear Dakota Advertising Agency, any advertising matter of any nature we publish for you in the future will be paid for in advance. We must make this request because of the company you keep.

"We hope to see the time when the laws not only of Nebraska, but of the United States will not allow this sort of temptation to be placed in the way of advertising agencies and newspaper owners."

He closes by saying:

"The grafter who used to work the shell game in the sideshow tent was cherubim and seraphim compared to the present day fake doctor, for he dealt with men who had ready money jingling in their jeans and who were enjoying life; while the victims of the fake doctor are quite generally from the poorer class and who are plunged in the depths of misery and despair.

"So there, dear Dakota Advertising Agency, are a few of the reasons why you will not receive marked copies of Sept. 30 and Oct. 7, containing the ad. of the Associated Doctors. We await your answer to our inquiries with well-controlled curiosity."

DR. A. R. LAW

He Asks Wisconsin Druggists to Become Quacks

A Wisconsin druggist sends us a circular letter sent to him from Madison, Wis., dated "October, 1914," and signed "A. R. Law, M.D." Our correspondent says that the druggists of his state are receiving copies of this letter, and he asks for information regarding Dr. Law's professional standing as well as an opinion on Law's method of procedure. The circular letter reads:

Dear Sir:—Do you know of someone who is suffering from rheumatism, erysipelas, or sexual impotence?

Listen!

I can place in your hands a remedy for each of these diseases that will effect an absolute cure. I guarantee it.

With a large medical practice of over thirty years, I have had a splendid opportunity to study these diseases. I have specialized in them and the remedies I now offer you are the results of years of patient study and experimenting. I have used them in my regular practice and certain and positive cures have invariably resulted.

These remedies are placed through druggists only. I do not advertise them as to do so would at once place me in a class with the many quacks and "so-called" doctors now imposing on the public.

My prices are—for rheumatism, $10.00; for erysipelas, $25.00; for sexual impotence—men $10.00; women $5.00. All preparations sent free of expense to you to be paid for when disposed of less a commission of 20 per cent.

Every druggist is, in a measure, the neighborhood doctor and will find my remedies of immense value to him. I want YOU to try them.

Select someone you know and on whom you can rely and let him try one of my preparations. I will send it to you; the patient to pay for it, give it a fair trial, and if it fails to cure or he is not benefited more than the price of the medicine, refund his money. If satisfied remit to me less your commission of 20 per cent.

References as to professional and social standing gladly furnished and all questions and correspondence answered immediately.

Sincerely yours,

A. R. Law, M.D.

According to our records, in July, 1911, Dr. A. R. Law of Madison, Wis., was arrested on the charge of performing an illegal operation on a woman resulting in the death of the patient. In September, 1912, he was found guilty and sentenced to six years imprisonment in the Wisconsin State Penitentiary at Waupun. In March, 1914, Law's sentence was commuted from six years to three years. This made him eligible to parole, and in the latter part of May of this year Law was paroled. At the time he was sentenced to prison, Law's license was revoked and, according to the secretary of the State Board of Medical Examiners for Wisconsin, this license has never been restored. Law's present activities indicate that official clemency was misplaced.

1. "The Itinerant Quack," THE JOURNAL, Sept. 6, 1913.

Correspondence

Sterilization of Apparatus for Anesthesia

To the Editor:—The statement by Dr. A. H. Miller in THE JOURNAL, Oct. 24, 1914, p. 1474, that "no apparatus [for administering nitrous oxid-oxygen] previously described can be readily sterilized and in most, sterilization would be impossible without destroying the instrument," is so far from being correct that I cannot allow this sweeping statement to pass unnoted. Many, if not indeed quite all, of the different apparatus that have been described from time to time in THE JOURNAL, and in surgical literature in general, may be readily sterilized. In fact, if this were not the case it would be a sad comment on anesthetic technic. A distinction should be made between advertisements and literature.

R. C. COBURN, M.D., New York.

Absence of Bony Pressure on Nervous Structures in Man

To the Editor:—My book, "The Intervertebral Foramen," was reviewed in THE JOURNAL, April 25, 1914, p. 1353. In this work I attempted to give an exhaustive description of the normal histology of an intervertebral foramen and its adjacent parts. The foramen described and photomicrographs shown were from the cat, as was stated in the text.

I have been in receipt of many letters and inquiries asking if these findings could be relied on to be identical with those of man. In order to answer this question scientifically I undertook a microscopic study of several different foramina and adjacent parts in man. These investigations corroborate those described in the original work. While no two intervertebral foramina have been found identical, they all appear to have a general structure very similar to the one described. However, the nervous structures in man, as a rule, occupy a smaller area of the foramina than was the case of the one shown of the cat. Therefore it would appear that they are even *better* protected from bony pressure than was the one from the cat.

HAROLD SWANBERG, Chicago.

[COMMENT.—This scientific study shows on what a slender foundation are built up such cults as chiropractic, etc.—ED.]

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

KARELL TREATMENT — BARIUM SULPHID AND BARIUM SULPHYDRATE

To the Editor:—I shall consider it a great favor if you will kindly enlighten me through THE JOURNAL, of which I am a recipient, on the following questions:

1. Of what does the Karell course of dieting consist and where can I find any literature on the subject?

2. Barium sulphuratum splendidly removes the hair from the skin, but the odor of this chemical is bad. The after-effects are also terrible in so far that the skin becomes very irritated, inflamed and smarts. How can we improve on the odor and prevent the irritation?

We are on the eve of a great international catastrophe but I do not see why the scientific mind should be influenced thereby. There ought to be more science and less armaments!

D. A. R., St. Petersburg, Russia.

ANSWER.—1. The Karell treatment consists of rest in bed and a light diet of milk and eggs. The fluid is limited to 1½ pints per day. At first this is given, for two or three days, as milk only, 6 to 7 ounces at 8 a. m., and 4 and 8 p. m. This is the most trying part of the method. Then 1 egg is given at 10 a. m. and a biscuit at 6 p. m. for a couple of days. Then 2 eggs with bread, and a little minced meat are allowed. In twelve days the patient returns to a careful ordinary diet, the fluid being still kept down to 1½ pints but not necessarily milk only. This method is said to be indicated for weak hearts for which digitalis is less appropriate. About the third day diuresis sets in for a short time, the dyspnea is relieved, the pulse improves, and the edema subsides.

The following may be referred to:

Strauss, H.: The Karell Milk Cure in Obesity, Med. Klin., March 27, 1910; abstr., THE JOURNAL, May 7, 1910, p. 1585.
His, W.: The Karell Milk Diet in Heart Disease, Therap. Monatsh., January, 1912; abstr., THE JOURNAL, Feb. 17, 1912, p. 524.
Wittich: Karell's Method of Treating Cardiovascular Disturbance, Deutsch. Arch. f. klin. Med., 1913, ex; abstr., THE JOURNAL, May 30, 1913, p. 1501.
Armbrust, G.: Karell's Milk Cure in Asystole, Brazil-med., Dec. 8, 1913.
Kimmerle, A.: Treatment of Obesity, Therap. d. Gegenw., October, 1913; abstr., THE JOURNAL, Nov. 15, 1913, p. 1854.

2. Barium sulphuratum or barium sulphid may occur in two forms: (*a*) the barium sulphid which is a powder having only a very slight, not disagreeable odor of sulphur, and (*b*) barium sulphydrate containing barium sulphid in combination with hydrogen sulphid which it gives off very readily, and hence has a disagreeable odor. Barium sulphid is an efficient depilatory and if the sulphid and not the sulphydrate is used, there need be no complaint of the odor.

VACCINE TREATMENT OF ARTHRITIS DEFORMANS—HIGH FREQUENCY CURRENT FROM PORTABLE COILS

To the Editor:—Please inform me: 1. Whether there is a serum or vaccine treatment for arthritis deformans. If so, what is its usefulness? 2. Do the portable coils primarily adapted to Roentgen-ray work also furnish a high-frequency current of value for treatment, as is claimed by every manufacturer of such coils? O. R.

ANSWER.—1. There is no serum treatment for arthritis deformans. The etiology of the disease is only now being worked out. The relation of foci of infection to this disease has been emphasized especially by Billings and cannot easily be overestimated. The changes in the joints are probably not due to the absorption of toxins from the focus alone, but to actual localization of the bacteria themselves. The difficulty in obtaining the causative organism is great, owing to chronicity; but by improved methods Rosenow has succeeded in isolating peculiar streptococci from the excised lymph-glands draining the involved joints, from contracted and diseased adjacent muscles, and from excised portions of the diseased capsule of the joint itself, and recommends the use of the vaccine prepared from organisms thus isolated rather than from the streptococci in the focus. The use of even these vaccines, however, is quite futile unless the focus is removed. The peculiar character of the changes, in which there is a proliferation of endothelial cells in the blood-vessels about the involved joints with a consequent anemic necrosis, makes it clear that no matter what vaccine or other remedial agent is used, cure in advanced cases will be exceedingly difficult. Removal of the focus, the judicious use of autogenous vaccines in small doses prepared not from the focus but from the adjacent lymph-gland or tissue itself, together with rest, good air, passive motion and forced feeding comprise at present the rational procedures and are yielding substantial results. The streptococci isolated are quite different from those obtained in rheumatism; hence the uselessness of employing rheumatism vaccines.

2. Most of the portable coils—which are really step-up transformers—are quite as well adapted to furnish a high-frequency current as to do Roentgen-ray work.

SIGNS OF DEATH FROM INSOLATION

To the Editor:—Please give in detail the usual post-mortem appearances in a person dying from insolation. Is there any essential difference between heat exhaustion and heat stroke? The texts on this subject are exceedingly limited. I should especially like to know the changes likely to occur in the kidneys after death from heat exhaustion.

F. L. CARSON, M.D., Shawnee, Okla.

ANSWER.—Without going into minutiae, the following are the principal changes found in the bodies of persons recently dead from sunstroke: marked congestion of the internal organs, including the brain and its membranes; the blood largely fluid on account of diminished coagulability; cloudy swelling of the liver and kidneys. There is usually marked and early rigor, decomposition sets in early, and in some cases the swelling and congestion of the spleen are extreme. Leukocytosis and alterations in the red corpuscles are also described. The condition described as heat exhaustion and typical sunstroke may occur under the same conditions, but exhaustion is stated generally to follow prolonged exposure to high temperature combined with physical exertion in con-

fined spaces, as in the stokerooms of steamships. There would seem to be some essential difference in the way in which heat exhaustion and sunstroke are caused, because in the former the distinguishing feature is depression of the body temperature far below normal and in the latter excessive elevation of the temperature: but it is possible that these changes in the temperature may be due to the same cause. No changes have been described in the kidneys as characteristic of heat exhaustion. There is an interesting discussion of the theories of sunstroke before the New York Academy of Medicine, reported in the *Medical Record*, 1900, lvii, 1130, in which the late Ira van Gieson points out that the symptoms indicate an intoxication due to changes in the blood, physical or chemical, and involving especially the nervous centers.

HOSPITAL FOR SMALL TOWN

To the Editor:—Our little town is planning on building a 10-room hospital building and furnishing it, and I would like to get what information I can regarding the specifications and price on a building of this size. I saw a couple of articles in THE JOURNAL a few months back regarding this, but I cannot find those articles and so I am appealing to you for aid.

X. Y. Z.

ANSWER.—In THE JOURNAL, Feb. 1, 1913, p. 390, there was published a list of articles on this subject. The following articles are supplementary and have been issued since that date:

Stevens, E. F.: The Ward Unit of the General Hospital, THE JOURNAL, Jan. 24, 1914, p. 270.
Lamoreaux, L. A.: Architecture of the Modern Hospital for Contagious Diseases, THE JOURNAL, Jan. 24, 1914, p. 274.
Schmidt, R. E.: Architecture of the Great Charity Hospital, THE JOURNAL, Jan. 24, 1914, p. 277.
Stevens, E. F.: Surgical Unit, European and American Architecture Compared—Description of Equipment, *Modern Hospital*, September, 1913. Abstracted in THE JOURNAL, Oct. 25, 1913, p. 1573.
Lambert, S. W.: Is Pavilion or Sky-Scraper Hospital Best? *Modern Hospital*, October, 1913.
Hornsby, J. A.: Equipment of a Small Hospital; Making over a Dwelling House, THE JOURNAL, Jan. 24, 1914, p. 267.
Greener, E. A.: Board, Staff and Special Departments of a Small Hospital, *Modern Hospital*, July, 1914.
Matteson, V. A.: Small Hospital of Low Cost, *Modern Hospital*, April, 1914.

THE ARNETH FORMULA

To the Editor:—What is the Arneth formula?

J. R. DEVELLING, Arbo, Miss.

ANSWER.—Arneth in 1904 suggested a classification of the polymorphonuclear neutrophils as a guide in the prognosis of infectious diseases. He classified polynuclears into five classes, depending on the number of the nuclei contained in a cell. He determined that in the normal person a fairly constant relative percentage of the cells was found in each of the five columns as shown in the following table:

THE ARNETH CLASSIFICATION

Column	1	2	3	4	5
Percentage	5	35	41	17	2

For a recent discussion of this subject the following reference may be consulted:

Henson, Graham E.: "A Study of the Arneth Formula," THE JOURNAL A. M. A., Sept. 12, 1914, p. 922.

QUESTION OF FUMIGATING SCHOOLHOUSES

To the Editor:—Would it be feasible to practice daily fumigation of schoolhouses with formaldehyd for the prevention of acute infections of the respiratory tract? Can you give a satisfactory method? If answered through THE JOURNAL, please omit name and address.

S. D. N.

ANSWER.—It is, of course, physically possible to fumigate a schoolhouse daily with formaldehyd, but the advantage of such a procedure is questionable. It is now the general belief that the germs of the acute infections of the respiratory tract do not survive very long outside of the body. The trend of recent investigation has been to show that the main danger of infection is by direct transmission from convalescents, mild cases, and healthy carriers. Better results are likely to be obtained in preventing the spread of most infections by giving attention to the human sources of infection rather than by resorting to frequent fumigation with a germicidal gas.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARKANSAS: Little Rock, November 10-11. Sec., Dr. W. S. Stewart, 404 Citizens Bank Bldg., Pine Bluff. Homeopathic, Little Rock, November 12. Sec., Dr. Scott C. Runnels, 900 Scott St., Little Rock. Eclectic, Little Rock, November 10-11. Sec., Dr. C. E. Laws, Ft. Smith.

CALIFORNIA: Los Angeles, December 8. Sec., Dr. Charles B. Pinkham, 727 Butler Bldg., San Francisco.

CONNECTICUT: New Haven, November 10-11. Sec., Dr. Charles A. Tuttle, 196 York St., New Haven. Homeopathic, New Haven, November 10. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven. Eclectic, New Haven, November 10. Sec., Dr. T. S. Hodge, 19 Main St., Torrington.

DELAWARE: Dover and Wilmington, December 8-10. Sec., Dr. H. W. Briggs, 1026 Jackson St., Wilmington.

FLORIDA: Palatka, December 2-3. Sec., Dr. E. W. Warren, 102 Front St., Palatka.

MAINE: Portland, November 10-11. Sec. Dr. Frank W. Searle, 776 Congress St., Portland.

MARYLAND: Baltimore, December 8. Sec., Dr. J. McP. Scott, 137 W. Washington St., Hagerstown.

NEBRASKA: Lincoln, November 11-12. Sec., Dr. H. B. Cummins, Seward.

NEVADA: Carson City, November 2. Sec., Dr. S. L. Lee, Carson City.

OHIO: Columbus, December 8-10. Sec., Dr. George H. Matson.

PENNSYLVANIA: Philadelphia, December 1-3. Sec., Dr. N. C. Schaeffer, Harrisburg.

SOUTH CAROLINA: Columbia, November 9. Sec., Dr. A. Earle Boozer, 1806 Hampton St., Columbia.

TEXAS: Waco, November 10-12. Sec., Dr. W. L. Crosthwait, Amicable Bldg., Waco.

Connecticut Homeopathic July Report

Dr. E. C. M. Hall, secretary of the Connecticut Homeopathic Medical Examining Board, reports the written examination held at New Haven, July 14, 1914. The total number of subjects examined in was 7; total number of questions asked, 70; percentage required to pass, 75. One candidate was licensed by examination and three through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
New York Med. Coll. and Hosp. for Women	(1913)	89

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Boston University	(1896) New Jersey; (1908)	Mass.
New York Homeo. Med. Coll. and Flower Hosp.	(1903)	New York

Connecticut Eclectic July Report

Dr. T. S. Hodge, secretary of the Connecticut State Board of Eclectic Medical Examiners, reports that one candidate, a graduate of the Eclectic Medical University, Kansas City, in 1912, was licensed through reciprocity with Arkansas, July 14, 1914.

North Dakota July Report

Dr. G. M. Williamson, secretary of the North Dakota State Board of Medical Examiners, reports the oral, practical and written examination held at Grand Forks, July 7-10, 1914. The total number of subjects examined in was 13; total number of questions asked, 110; percentage required to pass, 75. The total number of candidates examined was 6, all of whom passed. Six candidates were licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery	(1913)	80.8
Northwestern University	(1914)	81
Rush Medical College	(1914)	85
University of Illinois	(1913)	83
Marquette University	(1913)	75
Queens University, Kingston, Ontario	(1908)	75

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Northwestern University	(1910)	Illinois
University of Illinois	(1912)	Illinois
Johns Hopkins University	(1907)	Minnesota
Washington University	(1907)	Illinois
Hahnemann Medical College and Hosp., Philadelphia	(1902)	Minnesota
Milwaukee Medical College	(1910)	Wisconsin

Book Notices

Die Lehre von okkulten Blutungen. Von Prof. Dr. I. Boas. Paper. Price, 5 marks. Pp., 149, with 5 illustrations. Leipsic: Georg Thieme, 1914.

In every obscure case of gastro-intestinal disease, as well as in many not obscure, an examination or repeated examinations should be made for occult blood in the contents of the stomach and feces. Boas describes the technic of these examinations, estimates the value of chemical and physical tests, considers the meaning of occult blood derived from the different parts of the gastro-intestinal tract, and lastly discusses prognosis and treatment. The chapters on the technic of a search for occult blood and its diagnostic significance are the ones most generally interesting. This necessitates the discussion of the differential diagnosis of all the lesions of the esophagus, stomach and intestines which may cause blood to appear in the contents of the stomach and intestines. Occult blood also sometimes appears in the feces because of disease of the liver, pancreas, heart, kidneys and infections, such as typhoid. Therefore the field of differential diagnosis is extensive, a consideration of which the presence of occult blood in the feces makes necessary. No one could discuss this with more authority than Boas. The book contains several illustrations and one colored plate of spectroscopic findings.

Auricular Flutter. By William Thomas Ritchie, M.D., F.R.C.P.E., F.R.S.E., Physician to the Deaconess Hospital, Edinburgh. Cloth. Price, 10 shillings 6 pence net. Pp., 144, with 107 illustrations. Edinburgh: W. Green & Son, 1914.

This book is well printed, and many of the illustrations are heavy paper reproductions of electrocardiograms. The subject of auricular flutter has been carefully studied by the author, who reviews the work of others and records the results of his own clinical and experimental research. The relation of flutter to auricular fibrillation, to block, and to other types of tachycardia is discussed. What is known of the pathology of the condition and its clinical manifestations is also detailed. An introductory chapter gives some of the salient points regarding the origin of the heart-beat and the conducting system of the heart, together with some of the commoner disturbances such as extrasystole and auricular fibrillation. Some of the elementary facts concerning the electrocardiogram are also set forth with unusual clearness. The monograph is in every sense a credit to British clinical research and is indispensable to one who desires to have an authoritative epitome of what is known concerning auricular flutter. It is particularly valuable to one who wishes to have under one cover the important contributions to this subject made by Ritchie.

Klinische Röntgendiagnostik des Dickdarms und ihre physiologischen Grundlagen. Von Privatdozent Dr. Gottwald Schwarz, Assistant und Leiter des Röntgeninstituts der K. K. I. Mediz. Universitätsklinik in Wien. Paper. Price, 10 marks. Pp., 153, with 108 illustrations. Berlin: Julius Springer, 1914.

This is a useful and practical monograph for those interested in the examination by Roentgen ray of the colon rendered opaque by shadow-casting substances. Special chapters are devoted to the anatomy and physiology of the colon and the technic of examination. The clinical value of the Roentgen-ray method is emphasized by carefully executed diagrams and by reproductions of well-selected plates. Due credit is given to the works of American actinologists and some of the plates credited to them.

Analytical Tables of the Anatomy and Physiology of the Fifth Cranial or Trigeminal Nerve and of Its Ganglia and Connections. Being a Compendium of the Map-Scheme of this Nerve. By Dr. L. Hemington Pegler, M.D., M.R.C.S., Senior Surgeon, Metropolitan Ear, Nose and Throat Hospital. Cloth, Price, $8. New York: Paul B. Hoeber, 1913.

This chart, accompanied by a thirty-page pamphlet of analytical tables of the peripheral distribution of the trigeminal nerve, is well designed, clearly printed and accurate. The Basel anatomic nomenclature is followed with, however, some modifications, which do not in all cases seem advantageous.

Miscellany

The Bacteriologic and Chemical Quality of Commercial Eggs

The scientific literature on the bacteriology and chemistry of eggs is surprisingly meager, considering the importance of this article as food. In a recent report (Pennington, M. E., and others: A Bacteriological and Chemical Study of Commercial Eggs in the Producing Districts of the Central West, Bull. 57, U. S. Dept. Agric., July 20, 1914), the Food Research Laboratory of the Bureau of Chemistry discusses the quality of eggs which go to the egg-packing establishments in the Middle West. The work done is part of an investigation of the preparation of frozen and dried eggs.

In eggs, as in other foodstuffs, bacteria may increase enormously before producing changes capable of detection. Fresh eggs (eggs not more than twenty-four hours old, which have been kept in a cool place) may contain a wide variety of bacteria, but in small numbers. *Bacillus coli* is practically never present. Bacterially "market fresh" eggs were found not to differ markedly from strictly fresh eggs.

The best and simplest index of the chemical stability of the egg is the amount of loosely bound nitrogen present. Most of this is contained in the yolk. Western summer eggs of highest quality gave an average of 0.0013 per cent. loosely bound nitrogen in the whole eggs, and 0.0023 per cent. in the yolk.

In this investigation, eggs of various grades were examined, samples of each being opened aseptically in the laboratory and compared with composite samples opened commercially in the packing-house. A large proportion of the eggs used in the frozen and desiccated egg industry are classed commercially as "seconds." In the spring, before the candling season begins, this grade consists of eggs sorted out as small, dirty or oversized. After June 1, when all incoming eggs are graded according to the condition of the contents, seconds also include shrunken eggs, "hatch spots," "weak eggs" (stale eggs in which the form and position of the air space change on candling), etc. Among the classes of eggs generally or always detected and rejected by the candlers are those with bloody whites, the "white rots" (eggs in which the whites and yolks are intermingled), the "heavy spots" or "spot rots" (eggs having the yolk adherent to the shell) and "black rots" (eggs in the last stages of decomposition). Of these classes of eggs, 100 per cent. of the "black rots" and the eggs with yolks heavily adherent to the shell, 83.2 per cent. of the "white rots"and 66.6 per cent. of these eggs with yolk slightly adherent to the shell were found to have bacterial counts of over 1,000,000 per gram. *B. coli* were present in most of the samples. The eggs with bloody whites showed less than 5,000 organisms per gram, though 40 per cent. of eggs with "blood rings" due to partial incubation were found to have over 1,000,000 organisms per gram.

Some other classes of deteriorated eggs are seldom distinguishable by candling. These cause much trouble in the frozen and dried egg industry. The majority are comprised in three groups: eggs which have a greenish tinge in the albumin; "sour eggs," which have a peculiar pungent odor when opened, and "musty eggs," which have a penetrating, persistent odor suggesting that of the common jimson weed. No conclusive investigation was made of the "musty eggs." These and the "sour eggs" are always rejected by the egg-breakers. Some establishments reject the eggs with the green whites if the breaker happened to detect them; others use them if odorless. Both the "sour eggs" and the eggs with greenish albumin are invariably found heavily infected with bacteria (over 1,000,000 to the gram). Most of the classes of eggs showing high bacterial counts would be rejected by the housewife or conscientious baker on inspection.

The average amount of ammoniacal nitrogen (wet basis) rises from 0.0013 per cent. in fresh eggs to 0.0017 per cent. in stale eggs, 0.0019 in dirty eggs, 0.0020 in eggs with yolk partially mixed with white, 0.0023 in eggs with yolk slightly

adherent to the shell, 0.0036 in "white rots," 0.0040 in eggs with yolk heavily adherent to the shell, 0.0043 in "sour eggs," 0.0042 in eggs with a green white, and 0.0229 in "black rots." While a dirty shell is not positive evidence that the egg within is contaminated, such eggs do not keep well. Mold may appear in either clean or dirty eggs; it often appears directly beneath a spot of dirt on the shell.

It is suggested that there may be a connection between the moisture content of the egg and its keeping qualities. A study of the water content of fresh eggs from the middle of February to the first of November shows that in August and September, when the quality of the eggs is considered lowest, the water content is highest; in the early spring, when the eggs are of highest quality, the water content is lowest. This statement of the increased water content is not made authoritatively, but merely as suggesting a promising field for investigation.

A study such as this is the basis on which a more detailed inspection of the complete egg industry must be founded. The next report is to deal with commercial procedures in the packing-house, environment, etc. Later investigations will carry the research to the final use of the prepared egg by the baker or the housewife. The work is elementary and practical and the first report indicates a quality and thoroughness which prove still further its great value.

Systematic Impairing of the Appetite in Treatment of Obesity

W. Sternberg has long been preaching that dietetics is the Cinderella of the medical sciences. In these days of what Rubner calls the "hypertrophy of chemistry," dietetics is made to serve as the slave of chemistry. Everything is estimated by weight and measures when, in reality, qualitative factors, rather than quantitative, are of predominant importance in nutrition. More use, he declares, should be made of drugs to reduce the appetite and prevent hunger in overhearty eaters, while medicines of any kind should be punctiliously avoided when it is a question of increasing and tempting the appetite. Even the healthiest would soon lose their appetite if they were taking medicines as systematically as are given to many patients in our sanatoriums.

In his recent protest against this, in the *Allgemeine medicinische Central-Zeitung*, he says that he has found preparations of iodin particularly useful to reduce the appetite; and also that by anesthetizing the stomach mucosa even the sensation of hunger is warded off. Even peppermint lozenges or menthol tablets reduce the sensibility of the esophagus and stomach, and minute doses of camphor have the same effect plus a sensation of satiety—all of which logically aid in treatment of obesity. THE JOURNAL has previously mentioned his endorsement of coffee, taken early in the meal, in treatment of obesity. Coffee, he reiterates, reduces the appetite for other food and is also liable to interfere with sleep—the overcorpulent are usually inclined to sleep too much.

Pellagra Treated with Picric Acid

In thirty-five cases the eruption was treated by W. T. Wilson (Bulletin Harris County Medical Society, July, 1914) with picric-acid gauze official, or gauze soaked in a saturated solution of picric acid. For mucous membranes a 0.5 per cent. solution was used as a gargle. Internally most patients were given 25 drops of a 1 per cent. solution three times a day; some ¼ to ½ grain every three hours. Only three patients were put on a diet. All three were insane and were placed on milk and eggs for from seven to ten days and regular diet after that.

Improvement is first noted in the mucous membrane of the mouth, tongue and throat about the fourth day; in about five days intestinal symptoms improve, and in about seven days the skin begins to desquamate and assumes a natural appearance. A majority of these cases had the dry form, but four or five were of the moist form of erythema. The two types were equally amenable to treatment. There were no toxic effects from the drug in evidence in any case.

Medicolegal

Authorized Garbage Reduction Plant Not a Public Nuisance

(Toledo Disposal Co. vs. State (Ohio), 106 N. E. R. 6)

The Supreme Court of Ohio reverses a judgment imposing a fine of $300 on the disposal company for maintaining a public nuisance, and ordering it to abate the same. The court says that the mode of disposing of garbage and refuse matter is one of the difficult questions involved in municipal sanitation. Its great importance is not doubted. It is true that there has not yet been complete agreement as to the best and most appropriate method for the disposal of garbage and refuse material; but the testimony tendered and rejected in this case showed that the city of Toledo made every effort to proceed on the most modern and scientific plan. The city in the discharge of its duty to safeguard the health of its people pursued the course pointed out by the state. It would seem to be incontrovertible that the court would not construe that to be a crime punishable under one statute which was done in the exercise of powers specifically granted by another statute. Such a holding would be contrary to established rules of construction. It would, in effect, attribute to the legislature a disregard of wise public policy. The state cannot maintain a criminal prosecution against a defendant for conducting a plant and business located, constructed and operated under an express contract with a municipality, made under legislative authority, where the plant is conducted under municipal control and regulation, with care and skill, and in such manner as to produce the least possible annoyance, and where it is all done for the purpose of conserving the health and safety of the public. In the exercise of the police power, the state and municipal authorities may make all such provisions as are reasonable, necessary and appropriate for the protection of the public health and comfort, and when any such provision has a real and substantial relation to that object and does not interfere with the enjoyment of private rights beyond the necessities of the situation, every intendment is to be made in favor of its lawfulness.

Failure to Invert Foot in Treatment of Pott's Fracture

(Marchand vs. Belin (Wis.), 147 N. W. R. 1033)

The Supreme Court of Wisconsin affirms a judgment for the defendant, who was charged with malpractice in the treatment of a Pott's fracture. The court says that the evidence showed that the fracture was a severe one, in which the fibula was splintered and the ligaments of the ankle-joint were ruptured; that the foot was much swelled and discolored, and the skin was partly abraded in places at the time of the first treatment. As to the condition at that time, January 23, and from then until about February 13, there was no evidence other than that of the defendant, and if his evidence as to the conditions existing and the treatment given was true he was guilty of no malpractice. The plaintiff, aged 52, sustained the injury January 23, by falling from a ladder.

It was contended in the plaintiff's behalf that, since the evidence showed that the conditions testified to by the defendant did not usually obtain in ordinary Pott's fractures for so long a time, the jury had a right to find that they did not in this case. Hence, since it was shown that in cases of ordinary Pott's fractures the danger of gangrene was usually passed in from seven to ten days, and since bony union does not take place until the third week, the jury might find malpractice from failure to invert the foot after the danger of gangrene had passed and before bony union took place. The difficulty with this contention was that the plaintiff's fracture was not an ordinary Pott's fracture, but a severe and complicated one; that there was nothing inherently or obviously incredible about the defendant's testimony as to the conditions found the first day he examined the leg, or as to their continuance for the length of time shown. The trial court, therefore, properly held that such conditions must be held as verities, since there was no evidence to the contrary.

Another claim made was that the evidence of the defendant showed that he was ignorant of the practice of inverting the foot in cases of Pott's fractures, and therefore did not do it in this case. Conceding, for the sake of argument, that this was true, still, if the treatment he gave was the proper one under the conditions existing, his ignorance became immaterial. He said, however, that the reason he did not invert the foot up to about February 13 was because he feared gangrene, and that thereafter bony union began, and he did not deem it good practice then to invert it. The treatment given under the conditions as testified to by the defendant was practically sanctioned by all the physicians who testified as to what constituted good practice. It was therefore shown that the defendant exercised such care and skill and pursued such treatment as physicians and surgeons in good standing usually exercised and pursued in the same or similar localities under the same or similar circumstances. This measured the extent of his undertaking.

In an action for malpractice it is incumbent on the plaintiff to show wherein the defendant has been negligent or failed in his duty under the circumstances or conditions existing in the case that is tried. It is not enough to show that generally, or under other conditions, the conduct complained of might be found negligent.

Residence and Failure to Register Authority Must be Alleged

(Young vs. State (Tex.), 167 S. W. R. 1112)

The Court of Criminal Appeals of Texas reverses a conviction of unlawfully practicing medicine, for want of allegations as to the defendant's residence and failure to register his authority for practicing medicine. The court says that very soon after the act of 1907 was passed it held that it was essential to allege the residence of the accused and that he had not registered his authority or license in the district clerk's office of the county of his residence. Several legislatures of the state have had sessions since then, and, in addition, the revised penal code was adopted, and at no time and in no way has the legislature changed the act as originally enacted. The court has again carefully considered this whole act and is of the opinion that, because of the language thereof, both of said allegations are necessary, and an indictment or complaint and information which omits them is fatally defective. It probably would be sufficient if the pleading should allege that the accused's residence is unknown, or that he is a non-resident of the state, as the case may be, and that he has not registered his certificate or authority in the county where it is alleged he has unlawfully practiced; but it is unnecessary for the court to decide that question in this case. This court erroneously held the information in Stiles vs. State, 148 S. W. R., 326, sufficient, when it omitted said allegations, and that case on that point is hereby expressly overruled.

Death from Occupational Disease Not Accidental

(Adams vs. Acme White Lead & Color Works (Mich.), 148 N. W. R. 485)

The Supreme Court of Michigan reverses a judgment of the Industrial Accident Board, which awarded compensation for an occupational disease, or death, from lead poisoning. The court holds that the Michigan workmen's compensation act was not intended to provide compensation for industrial or occupational diseases, but for injuries arising from accidents alone. The board thought that the controlling provision of the statute on this point was, "If an employee . . . receives a personal injury arising out of and in the course of his employment," he shall be paid compensation, etc. But the court thinks that it should be held that the words "personal injury," as quoted by the board, refer to the kind of injury included in the title and other portions of the act, which plainly refer to "accidental injury to, and death of, employees." The court is not able to find a case in which an employee has recovered compensation for an occupational disease at common law.

Society Proceedings

COMING MEETINGS

Amer. Assn. for Study and Prevention of Inf. Mortal., Boston, Nov. 12.
Amer. Public Health Association, Jacksonville, Fla., Nov. 30-Dec. 5.
Medical Association of the Southwest, Galveston, Nov. 10-11.
Medical Society of Hawaii, Honolulu, Nov. 28-30.
Southern Medical Association, Richmond, Nov. 9-11.
Southern Surgical and Gynecological Assn., Asheville, N. C., Dec. 15-17.
Western Surgical Association, Denver, Dec. 18-19.

MINNESOTA STATE MEDICAL ASSOCIATION

Annual Meeting held at St. Paul, October 1-2, 1914

The President, Dr. A. E. Spalding, Luverne, in the Chair

Prostatectomy

Dr. E. S. Judd, Rochester: The suprapubic operation insures a perfect functional result, but the opening into the bladder must be made through a loose cellular fat tissue in the space of Retzius. This tissue once infected is difficult to drain and, while the infection is not virulent, it may prove serious in a patient whose kidneys are already badly damaged. We have endeavored to develop a technic in performing the suprapubic operation which would minimize the possibilities of infection in this space. The bladder is cleansed and emptied and the catheter is left in place. There is less danger of infecting the suprapubic space by opening into a dry, clean bladder than into one distended with wash water. The hypertrophied prostate is enucleated in the usual way and the capsule immediately packed with gauze. The wound in the bladder is then retracted open by three Walker retractors. The catheter is drawn out of the suprapubic opening, caught by a clamp and held to one side. The gauze is removed from the prostatic capsule, and the bladder edge of the capsule is sutured with firm, plain catgut. No attempt is made to catch the torn off end of the urethra, but the needle is passed as deeply as possible into the prostatic tissue. By carefully sponging and placing the sutures at the bleeding points in many cases it is possible completely to control the oozing. The clamped end of the catheter is left out of the suprapubic opening in the bladder and the bladder closed tightly around it. A good sized hole is cut in the side of the catheter just above its entrance into the urethra. This method of leaving the catheter projecting through the suprapubic wound into the bladder is a safeguard against clotting and serious spasm. As soon as the urine is free from blood, the catheter is drawn into the bladder where it is left for a number of days. In many cases there is no urinary leakage at any time. In the few instances in which leakage occurs, the urine runs over a surface already granulated and these granulations prevent infection in this space.

DISCUSSION

Dr. Oscar Owre, Minneapolis: A short time ago I performed cystoscopy on a man, 50 years of age, who was complaining of some urinary obstruction and symptoms suggestive of stone in the bladder. The cystoscope slipped through a large urethra, and springing from the bladder and close to the vesical neck could be seen a small smooth adenomatous overgrowth from one of the glands, about the size of a hazelnut. This could be pushed from side to side into the bladder. It was removed and the patient recovered. There was no prostatic hypertrophy recognizable on palpation through the rectum and no impingement with the cystoscope in the bladder. By refined cystoscopic methods we may be able to ascertain the exact growth that is responsible for the obstruction and then direct our surgical procedure accordingly.

Dr. Robert Earl, St. Paul: The two lateral lobes of the prostate are histologically one, but physiologically they are separate. This is of great importance, especially in treating tuberculosis of the prostate, in which condition it would not be wise to try to enucleate the entire prostate but simply curet out and treat the diseased side in order that the tuberculous infection may not be spread to the other side.

Suprapubic Cystotomy

DR. THEODORE BRATRUD, Warren: The bladder can be opened suprapubically in the majority of cases by local anesthesia, our preference being for one-quarter of 1 per cent. novocain infiltrated in the line of incision. We have found that instillation of a 1 per cent. solution of quinin and urea hydrochlorid into the bladder one-half hour before operation is of material assistance in reducing the pain, which cannot be so well controlled by infiltration, and it lessens the discomfort after operation. It is preferable to use water dilatation of the bladder. In cases that are badly infected, it may be advisable to drain off the water as soon as the peritoneal fold overlapping the bladder is out of the way and guy sutures inserted into the bladder. This procedure is not so essential when one makes use of the method suggested by Rovzing to apply a 1 per cent. silver nitrate solution to all the exposed tissues before the bladder is opened. We have followed this method in all of our cases, and in no case have we had any signs pointing to infection of the space of Retzius. It is important to secure an opening as high on the bladder extraperitoneally as possible, if it is planned to allow the drainage opening to close. This technic is not possible in cases of contracted and hypertrophied bladders, as satisfactory distention of the bladder cannot be secured and the peritoneal fold must be lifted out of the way by dissection. In these cases local anesthesia will hardly suffice, but with a small amount of ether the operation can be accomplished readily. In these cases the use of a sound, when the bladder can be entered by the urethra, is essential. Patients who come with enormously distended bladders, which it is feared to empty at once, can be handled safely by introducing a small aspirating needle into the bladder and leaving it *in situ* for twenty-four hours or longer. As soon as the bladder is opened and its contents removed, the interior can be inspected and calculi removed if present, and the bladder closed around a Pezzer catheter. A small wick saturated with 1 per cent. silver nitrate solution is introduced into the space of Retzius and the hole is closed in the usual manner. Ordinarily a rubber bag connected to the catheter with a small glass tube furnishes a satisfactory receptacle for the urine.

DISCUSSION

DR. ARCHIBALD MACLAREN, St. Paul: Cystotomy, when found necessary, should be preceded by cystoscopy. After we have determined that a patient has an infected bladder, with prostatic obstruction, the thing to do is to establish drainage through the urethra, which will help these patients tremendously. The mortality unquestionably has been greatly reduced in the last few years since we began to drain these bladders and to relieve back pressure on the kidneys.

DR. ARTHUR N. COLLINS, Duluth: In order to put a catheter in the bladder to get permanent drainage, do not stab the bladder, and if drainage is attempted, get plenty of room. After you have put in a drainage tube, see that it is in the bladder, and that it is anchored so that it will stay in the cavity.

DR. FRANKLIN R. WRIGHT, Minneapolis: It may be advisable to use the cystoscope in early cases of enlarged prostate, but certainly in extreme cases, in which the urethra is bent at a right angle, it would be a mistake to undertake to pass a straight instrument through it. The suprapubic method for enlarged prostate in my opinion is the one which will be adopted as the standard.

DR. JAMES E. MOORE, Minneapolis: Dr. J. E. Summers of Omaha a number of years ago called attention to the fact that many of the old men who die promptly after prostatectomy could undoubtedly have been saved if a suprapubic cystotomy had been done first, drainage established, getting the kidneys to work properly, and prostatectomy then performed.

DR. R. E. FARR, Minneapolis: There is danger in emptying the distended bladder. It is my practice to introduce a small trocar. The bladder may be emptied the first time, or if completely emptied, it is immediately filled with saline solution or a mild boracic acid solution to prevent future trouble. Then a suprapubic cystotomy is done.

DR. CHARLES H. MAYO, Rochester: There is great risk in suddenly and completely emptying a bladder that is enormously distended. I have seen unfortunate results from the use of the catheter in such cases, the men dying rapidly from a hemorrhagic condition of the kidneys. I have seen good results obtained by drainage for temporary purposes; with the catheter tied in the urethra one can get as good drainage as from suprapubic cystotomy. Thirty years ago Hunter McGuire brought out the simple method of opening the bladder for stone. He instituted suprapubic drainage and relieved old men for a time, then later he removed the real cause of the trouble—the enlarged prostate.

Herter's Infantilism

DR. OLIN W. ROWE, Duluth: In a case of this kind I made use of a vaccine prepared rom a culture of the *Bacillus coli*. June 14 ten million were given. On the following day the child felt some better, and took 3 ounces of skimmed mother's milk without the stomach tube. A further loss in its weight was recorded. A slight desire to eat was observed on the day following. Two days later twice the original dose of vaccine was given. This was followed by a stay in the loss of weight. The child felt better, developed an appetite and did not lie in the semicomatose condition which had been such a prominent feature of the preceding week. From this time on the vaccine was given in rapidly increased doses, every third or fifth day, until the hundred million mark was reached, at which time there was a slight reaction. The dose was dropped to fifty million, and then increased rapidly to ninety million. Twenty-three doses were given in all, the last one September 24. During this period of improvement the weight increased from 40 to 65 grams a day. Whole mother's milk rapidly replaced the skimmed milk, and this was in turn replaced by whole cow's milk, to which was added dextrimaltose, meat, gelatin, fish, etc. Her fat tolerance improved from a condition in which skimmed mother's milk was handled with difficulty, to a state which permits of 24 ounces of whole cow's milk without bad effect. The stools show considerable fat soup, but no free fats or fatty acids. Her tolerance for starchy foods has increased over 400 per cent. in two months. In fact, a general diet consisting of whole milk, cereals, vegetables, meat and a small amount of fruit pulp, with a total caloric value considerably in excess of her requirements, is taken without appreciable difficulty. This case is the second one reported in which vaccine therapy has been given a trial.

DISCUSSION

DR. J. P. SEDGWICK, Minneapolis: General infantilism is represented by myxedema, which is really more common in Minnesota than is generally believed. I have an infant now in the third month with myxedema, which is improving rapidly under thyroid extract. Mongolian idiocy is seen quite frequently in Minnesota. These cases are mistaken, by those who have not seen them, for the myxedematous type. Almost every patient that comes into the clinic has been given thyroid.

DR. W. R. RAMSEY, St. Paul: I have one or two cases of infantilism that are extremely troublesome and long drawn out. Their recovery is slow. In several instances I have been able to determine that the origin of the trouble was overfeeding. Two of these cases were greatly overfed with fat, so that they would come under Czerny's primary cause of fat injury. These cases are intolerant to fat even in small amounts.

DR. F. W. SCHLOTZ, Minneapolis: Cases of infantilism are quite rare. During my service in the dispensary the past four years I have seen but two cases of the type described. Analogous to the condition we find in children who have fat disturbances after being fed with cow's milk, there is a loss of the element of calcium in the feces and urine. Experiments carried on at the Rockefeller Institute in three cases show that the loss of calcium does not necessarily have any connection with the amount of fat that these children lose in the feces. Even if large amounts of phosphates and fatty and volatile acids are present in the feces, the calcium loss of the organism is not necessarily large on that account.

So there was no definite connection between the fat metabolism and the loss of calcium as these cases show.

Dr. E. J. Huenekens, Minneapolis: I would like to report a case under observation which I think comes under the classification of Founder's hyperdystrophy, but which may be classed as Herter's infantilism. It is a baby, 21 months old, which only weighs 6,200 grams, less than the normal weight for an infant 1 year old. The baby has received the best of attention since birth. The mother took it from the breast and put it on different mixtures, but these mixtures did not agree with the child, and the minute the baby was put back on breast milk it recovered promptly. Since the ninth month different forms of cow's milk have been tried without success. I am now trying a buttermilk preparation.

(To be continued)

INDIANA STATE MEDICAL SOCIETY

Annual Meeting held at Lafayette, Sept. 24-25, 1914

(Continued from page 1501)

Diagnosis and Treatment of Simple Glaucoma

Dr. Albert E. Bulson, Jr., Fort Wayne: Glaucoma simplex is a relatively common disease of middle or advanced life, and unattended by active inflammation. It is attended with increased intra-ocular tension, which, however, may be overlooked unless the examination is thorough. Its course is very insidious, and if unchecked terminates in blindness. Therefore, its early recognition and the adoption of appropriate treatment are of supreme importance. Among the early symptoms noted by the patient are transitory attacks of blurred vision, night blindness and the apparent necessity of changing glasses often. Considerable difference of opinion exists concerning treatment. Lowering the intra-ocular tension is the desired result. Of operations, there are several, including iridectomy, anterior and posterior sclerotomy, cyclodialysis and trephining. The last-named bids fair to supplant all other forms of operative treatment. The success of the trephine operation, however, depends almost entirely on a reasonably faultless technic. Medicinal treatment is confined to the use of the miotics, physostigmin or pilocarpin. Physostigmin is the more active. That miotic treatment does hold the disease in check for long periods of time cannot be doubted. In my own experience physostigmin in olive oil is less irritating than in aqueous solution, though there are some patients who do not tolerate physostigmin at all, and for whom pilocarpin must be prescribed. In my judgment, miotic treatment always should be the first treatment employed, and continued so long as effective. When it ceases to be effective, operative measures should be considered.

Inasmuch as arteriosclerosis, with its increased blood-pressure, chronic constipation, gouty and rheumatic diatheses are predisposing factors, it is incumbent on the physician to recommend appropriate treatment, and a proper regulation of the habits of life. Among operations, the trephine is to be preferred, and my results so far have been highly satisfactory. Though sufficient time has not elapsed to show what the ultimate outcome will be, several cases have shown for months a relatively normal intra-ocular tension and retention of the sight and fields of vision possessed at the time of operation. Preservation of the best vision for the longest period of time for the patient suffering from simple glaucoma necessitates discovery of the disease early in its progress, and the adoption of appropriate remedial measures.

DISCUSSION

Dr. D. W. Stevenson, Richmond: These patients are pessimists. A great many have peculiar mental symptoms, partly due to the eye trouble, but also associated with the general constitutional trouble. Of special importance is care in regard to the diet. The patients have gouty symptoms, arteriosclerosis, and high blood tension, and the treatment of these conditions often has a great deal to do in relieving the eye symptoms as well as the mental symptoms. I have done about eight trephine operations, and have had some excellent results with it. It is the most promising operation we have.

Dr. L. D. Brose, Evansville: The diagnosis of simple glaucoma is not always easy. Augmented tension and glaucoma are by no means identical conditions. It is rather a general experience to find the former, temporarily at least, during severe iritis, and yet the eye afterward remains free from glaucoma. A diagnosis of glaucoma should not rest on the disclosure of the ophthalmoscope; all other symptoms of the disease should be sought for. Progressive peripheral contraction of the nasal side of the visual field is highly indicative of glaucoma when found with unilateral cupping of the disk, or with bilateral excavation extending to the periphery of the nerve, with overhanging edges and recession of the lamina cribrosa. Misty vision and the appearances of halos are not of frequent occurrence in glaucoma simplex, but when present are corroborative evidence of its existence. Operative interference, even when done most skilfully, is only too often an uncertain means to an end, and we must remain content with having ameliorated some of the symptoms, while the disease per se is not cured. The patient's general condition should be studied carefully in all suspected cases.

Dr. F. C. Heath, Indianapolis: Glaucoma and cataract are both much more common in hot countries than elsewhere. The use of the tonometer is of much value and the regulation of the habits of the patient is very important. Nothing was said of internal treatment. It is of advantage to look after the elimination in these cases, and I attach some value to the use of the salicylates. In many cases I have seen advantage from the use of miotics. Regarding operative treatment: While iridectomy has served us well in acute glaucoma, we have been disappointed with its effects in chronic glaucoma. I have not yet had the opportunity to do a trephine operation, but have been led to believe that it is the operation to be done.

Dr. W. A. Hollis, Hartford City: I have injected subconjunctivally sodium citrate in 5 per cent. solution, as advocated by Fisher of Cincinnati, in connection with miotics, and its effect has been very gratifying, the tension subsiding somewhat in a very short while and the patient feeling much better.

Dr. T. C. Hood, Indianapolis: Trephining is a good operation.

Dr. A. E. Bulson, Jr., Fort Wayne: I look on every case of simple glaucoma as eventually an operative case. For that reason I am opposed to the subconjunctival injections of anything that may possibly produce adhesions. Also, I have noticed that nearly all who have reported end-results from the subconjunctival injection also employed a miotic. I get the same results with the miotic without sodium citrate. Concerning the trephine operation: We must not lose sight of the fact that the patient has a disease that is going to end in blindness. We know there are certain risks attending the trephine operation, but they are not one-tenth so great as those attending iridectomy. The secret of success in most of these cases is in dissecting the conjunctival flap very much as Elliott does, and then making the opening partly in corneal tissue, partly in scleral tissue, after the cornea has been split. My principal plea, however, is for earlier recognition of these cases.

Trachoma in Indiana

Dr. Eldridge M. Shanklin, Hammond: It is estimated that it costs the state $3,000 to educate a blind child. The greatest cost is not to the state, however, but to the county and the individual. Trachoma victims are rapidly appearing in the reports of many of our county asylums for the poor, and needlessly, too. In many cases intelligent, thorough and persistent treatment will get these people out of the poorhouse. Publicity is our greatest asset in fighting trachoma. We must assure the laity, and some physicians as well, that trachoma is a "dangerous, contagious disease," and that it is communicated chiefly through the use of a common towel, etc. Physicians should be urged to cease using the term "granulated eyelids" for any and all lid affections. This is a most pernicious habit. More publicity should be given to trachoma and its dangers; cases should be reported immediately, that the health authorities may be apprised of the real trachoma situation; committees on conservation of vision

should urge those making public addresses on conservation to go into this subject thoroughly.

DISCUSSION

DR. ALBERT E. BULSON, JR., Fort Wayne: Children who have the disease should be segregated. Regarding the cases that become indigenous, much can be done for these patients in the way of operation. I am convinced that there is absolutely nothing in the way of treatment that will take the place of the old copper sulphate treatment for trachoma.

DR. L. D. BROSE, Evansville: The trouble with most of these trachoma patients is that we treat them for awhile and they get well. Then they stop treatment, and after awhile return in worse condition than before. Among children the condition is neglected.

DR. W. F. HUGHES, Indianapolis: Ten years ago three-quarters of the trachoma cases were in persons of foreign descent. At the present time fully one-half of the patients who apply in the clinics for treatment are American-born citizens. I agree with Dr. Bulson that copper sulphate is a valuable agent in treatment. However, I place my reliance chiefly on silver nitrate. It has the objection, of course, of producing a faint stain, but that is a small point when compared with retained vision. I am perfectly satisfied that constant treatment—it makes no difference what you use—under sanitary conditions will make it possible for vision to be retained in a very large proportion of the cases. Education is most important; quarantine is out of the question.

Effects of Light on the Eye

DR. W. F. HUGHES, Indianapolis: The chief results of bad lighting systems are shown in a loss of efficiency, immediate and remote, and asthenopia. Proper diffuseness, with sufficient intensity to give maximum details, seems to be the goal, from the point of view of comfort and welfare of the eye. The increase of artificial illumination often producing distinctly harmful effects on the eyes demands a closer cooperation between lighting engineers and oculists, for the standardization of lighting systems, primarily on the basis of the effect on the eye.

DISCUSSION

DR. ELDRIDGE M. SHANKLIN, Hammond: The best proof of the fact that our present-day lighting systems are not meeting the requirements exactly is the fact that we are constantly being confronted by new systems. The most interesting side of this question is the traumatic effect of extreme light on the eyes. For example, the effect of the light coming from molten metal at different degrees. In the open hearth furnace steel process work the men all wear Cobalt blue glasses. The increasing use of the oxyacetylene process—whether in cutting or welding—has also increased the number of injuries to the eye from extreme light. Men doing this work should wear glasses made up of two layers of Cobalt blue, with an interposition of the red lens, and metal helmets.

The Bronchoscopic Treatment of Spasmodic Asthma

DR. GEORGE F. KEIPER, Lafayette: The bronchoscope is to be used after all other means have failed. Some of the patients treated by this method have been reported cured by one application of the bronchoscope. The introduction of the tube releases considerable secretion from the lungs, which secretion no doubt acts as a decided irritant to the mucosa of the respiratory tract, causing the spasm of the bronchi and bronchioles. My experience with this treatment has been limited to one case, a very severe and stubborn one, which yielded to the treatment, the asthma not having returned to date.

DISCUSSION

DR. GEORGE F. SPOHN, Elkhart: Regarding the psychopathic part of the question: I think this has a great deal to do in the treatment of these cases. These patients become alarmed when they begin to become dyspneic, and breathe through the mouth. If you will compel them to breathe through the nose at once, the bronchioles will not become dry. A favorable effect is produced by quieting these patients, and giving them the proper mental suggestion.

DR. ALBERT E. BULSON, JR., Fort Wayne: While I have used the bronchoscope for the removal of foreign bodies, I have never felt justified in using it in the treatment of spasmodic asthma, because I have obtained the same result and more easily by intratracheal injections of cocain. These cases require careful study, for they arise from many causes.

DR. P. R. CLAPPER, Lafayette: Ordinarily, for symptomatic relief, the injection of epinephrin chlorid, probably 10-drop doses, repeated daily, has a prophylactic value, and for immediate relief even as high as 15 drops would afford great relief, sometimes tiding the individual over the attack.

DR. GEORGE F. KEIPER: I wish to emphasize the fact that it is wise to exhaust every other means before resorting to a means of this kind, which is rather formidable. In passing the bronchoscope it is not necessary to use anesthesia. It can be passed quite easily by one accustomed to the introduction of such an instrument. Also, it is not necessary to use this method in every case, but it is certainly worth a trial in severe cases when all other means have failed.

Treatment of Incipient Cataract with Subconjunctival Injections of Mercuric Cyanid

DR. A. B. KNAPP, Vincennes: In the treatment of incipient cataract with subconjunctival injections of mercuric cyanid we hope to benefit some patients by staying the progress of the opacity. We must take the cases before the opacity is well advanced. In all of our cases we gave a hypodermic of morphin half an hour before giving the injection. After anesthetizing the conjunctiva, I grasp it with a fixation forceps and plunge the needle deeply into the orbit midway between the external and superior recti muscles. The pain is considerable, but usually subsides in two or three hours. The chemosis is intense, and even the eyelids and face sometimes puff up, until it is impossible to open the lids wide enough to see the eyeball. This swelling subsides in the course of a few days, without harm to any of the tissues. The strength of the solution used is 1:4,000; 20 minims is the dose usually used. When the opacity is well advanced one fails to get results. In none of my cases has the opacity advanced in the eyes treated, while in the fellow eye vision has failed in all cases that were not already blind. In one case the eye seemed to become myopic as the results of the treatment, while in another case the myopia was increased.

DISCUSSION

DR. ALBERT E. BULSON, JR., Fort Wayne: I have never used subconjunctival injections of mercury in incipient cataract, and do not think I ever shall. Colonel Smith has been using the treatment in a class of cases different from those we see in this country. Persons in India develop cataract at a much earlier age, when their physical condition is much better, and they can stand pain better. Cataract is not an infective condition; it is a disturbance of the nutrition of the lens. I fail to see how the subconjunctival injections of mercuric cyanid will have any effect, because the principal effect of mercury is in its action on an infective process, although it does have a certain effect in stimulating, perhaps, the reparative process. Subconjunctival injections of dionin have a very decided effect on the absorption of various opacities of the vitreous, aqueous humor and lens. I am not in favor of the use of subconjunctival injections of mercuric cyanid in cases of incipient cataract.

DR. A. B. KNAPP: The reaction in some cases is, of course, much greater than in others. This treatment is entirely new and will bear further investigation, but I feel that it should be tried. There is no age limit to its use. I would not fear to use it in any case in which I would feel safe in giving a hypodermic of ¼ grain of morphin.

(To be continued)

The Unity of Progress.—Remarkable achievements are never unique occurrences in nature. Even the greatest men rest on the shoulders of a large multitude of smaller ones who have preceded them; and epochal discoveries emerge out of a period of intellectual restlessness that affects many minds.—Flexner.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

October, CXLVIII, No. 4, pp. 469-624

1 *Clinical Value of Expectorants. J. L. Miller, Chicago.
2 *Relative Pulmonic Insufficiency. J. N. Hall, Denver.
3 Prevention and Treatment of Vulvovaginitis in Children. F. J. Taussig, St. Louis.
4 Direct Examination of Duodenal Contents (also Bile) as an Aid in Diagnosis of Gall-Bladder and Pancreatic Affections. M. Einhorn, New York.
5 *Disseminated Sclerosis. J. Collins, New York, and E. Baehr, Cincinnati.
6 Case of Sprengel's Deformity. G. Fetterolf and J. H. Arnett, Philadelphia.
7 Treatment of Amebic Dysentery, G. M. Niles, Atlanta, Ga.
8 Diagnosis of Tuberculosis in Early Life. H. R. M. Landis and I. Kaufmann, Philadelphia.
9 Difference in Morphology of Blood in Gastric Ulcer, Duodenal Ulcer and in Chronic Appendicitis. G. A. Friedman, New York.
10 *Myopathy: Eight Cases Comprising Various Types. T. J. Orbison, Los Angeles.
11 Use of Pituitary Extract in Control of Some of Associated Symptoms of Pneumonia Which Favor Hypotension. A. A. Howell, Philadelphia.
12 Traumatic Neurosis. T. A. Williams, Washington, D. C.
13 Granuloma Fungoides. M. G. Wohl, Philadelphia.

1. **Clinical Value of Expectorants.**—Ammonium carbonate and ammonium chlorid and the emetic group of expectorants, as apomorphin and ipecac, when given in sufficiently large doses to animals, Miller says, increase bronchial secretion. Ammonia salts per os in moderate doses equivalent to 2 mg. in an adult man, do not increase bronchial secretion in the dog. Apomorphin and emetin when given to dogs in doses considerably greater than the ordinary therapeutic dose for man do not excite increased bronchial secretion.

2. **Relative Pulmonic Insufficiency.**—Hall suggests that relative pulmonary insufficiency may be found in possibly 3 to 5 per cent. of cases of mitral stenosis. The diagnosis rests on the association of the following findings: 1. Some definite cause for increased pulmonary tension, notably mitral stenosis or fibroid phthisis in an advanced state. 2. The presence of increased precordial area of dulness, especially suggesting dilatation of the right ventricle. 3. The presence of a soft diastolic murmur heard at the region of the pulmonary valves, and transmitted downward from the second or third left intercostal space along the left side of the sternum. The murmur is exactly of the type found in aortic regurgitation, excepting that it is generally more soft and blowing. The most striking single feature is its inconstancy. After being present for days or weeks, with the regaining of a better condition of compensation the murmur disappears, to reappear with the next breakdown. It is absolutely essential to the diagnosis that the aortic valve sounds be clear and that no feature of aortic regurgitation be present. Fortunately, the insufficient filling of the left ventricle in mitral stenosis oftentimes renders the aortic second sound so notably feeble that the pulmonary signs are prominent by contrast.

4. Absence of thrill. This is not infrequent in the organic lesion, but is never found in relative insufficiency, and should therefore count against such a diagnosis. The presence of a systolic murmur at this orifice would militate against the diagnosis of relative leakage and be in favor of the organic type. 5. The murmur may be increased in intensity by expiration, especially with the closed glottis, the increased intrapulmonary pressure being the active agency in bringing about the exaggeration of the murmur. A similar increase may be noted after exertion. As is to be expected, the pulmonary second sound is commonly enfeebled by the failure of close apposition of the pulmonic leaflets.

5. **Disseminated Sclerosis.**—Disseminated sclerosis, according to Collins and Baehr, is encountered much less frequently in this country than abroad. This is due, in part only, to the fact that early and irregular cases frequently escape recognition here. The fully developed, classical Charcot type of the disease is rarely seen. Trauma, including occupation, injury, intoxications, biologic crises, mental shocks, etc., play only a contributing rôle in the development of the disorder. The disease is regarded by the authors to be a parenchymatous degeneration due to the action of a toxin circulating in the cerebrospinal fluid. There can be no rigid grouping of "types" of the disease. Nevertheless, three general groups can be assumed; a spastic-paretic, an ataxic and a hemiplegic group. The best single aid in the differential diagnosis is the condition of the cerebrospinal fluid. The Wassermann reaction is practically always negative. The number of lymphocytes is less than fifteen, and there is not excess of globulin. This is of special value in ruling out cerebrospinal syphilis. The remissions which sometimes occur are singularly characteristic of this disease. In their series, however, they were rarely encountered. The absence of the abdominal reflexes, upper and lower, is an important diagnostic sign.

10. **Myopathy.**—Among the eight cases cited by Orbison is one of myopathy in a colored person. In this case there has been an arrest of the condition for over a year. The electrical reactions in every case were a very much delayed response to the faradic interrupted current in the affected muscles. Two of the patients were brothers, but in no other case was the familial element present. In none of them was there a history of heredity. The exhibition of electricity was distinctly beneficial in at least one case. Little or nothing that was elicited in these cases could be considered in the light of an etiologic factor except muscle strain in one case and general exposure in another.

American Journal of Physiology, Baltimore

October, XXXV, No. 3, pp. 265-366

14 Viscosity of Blood on Inhalation of Alcohol. R. Burton-Opitz, New York.
15 *Factors of Influence in Origin and Circulation of Cerebrospinal Fluid. C. H. Frazier and M. M. Peet, Philadelphia.
16 *Extirpation of Testes and Vasomotor Irritability. H. Wheelon, Chicago.
17 Cause of Phase Difference Frequently Between Homonymous Peaks of Electrocardiogram. H. B. Williams, New York.
18 Blood and Urinary Amylase. C. E. King, Chicago.
19 Effect of Filtration Through Berkefeld Filter on Coagulability of Oxalated Plasma. C. H. Goddard, Baltimore.
20 *Is Contraction of Smooth Muscle Accompanied by Heat Production? C. D. Snyder, Baltimore.
21 *Effect of Intramuscular Injection of Pituitary Extract on Secretion of Milk in Human Subjects. R. L. Hill and S. Simpson, Ithaca, N. Y.

15. **Origin and Circulation of Cerebrospinal Fluid.**—The problem of absorption and secretion has been elucidated somewhat by the production of artificial hydrocephalus, so that it can be demonstrated without question, Frazier and Peet state, that the cerebrospinal fluid is almost, if not entirely, secreted within the ventricles, and that absorption does not take place until the fluid has escaped. The lateral ventricle, therefore, is, as the bladder, merely a receptacle for the storage fluid. Comparing the results of phthalein injection with and without obstruction of the lateral ventricles, it has been possible to elaborate a method for the differentiation of different types of hydrocephalus from the point of view of etiology. The cerebrospinal pressure has been found to vary with the pressure of the venous sinuses and to be practically identical with it. Under normal conditions there are certain oscillations which are due to the effect of inspiration and expiration on venous pressure, but they may be arrested by slight increase of intracranial tension. Closure of the carotid circulation causes an immediate but only transitory fall of cerebrospinal pressure, but obstruction of the venous circulation is followed by an increase in pressure more or less constant.

The normal rate of secretion was found to vary widely under normal conditions and was practically uninfluenced by such profound circulatory disturbances as complete closure of both common carotid arteries. The propriety of ligation of the common carotid arteries, recommended and practiced in cases of hydrocephalus, has not been established by exact laboratory methods.

The absorption of cerebrospinal fluid is largely by the venous channels. Lymphatic absorption is roundabout, slow and relatively diminutive. By the phthalein test, it was proved that from 50 to 60 per cent. is absorbed within two

hours. Within two minutes of an injection of phthalein into the lateral ventricles, the drug may be recovered from the blood in the torcular herophili. Absorption was found to be chiefly via the venous channels, so that obstruction to the venous outflow is immediately followed by a rise in venous pressure, by the accumulation of cerebrospinal fluid, and a resulting increase in intracranial tension.

16. **Influence of Testes on Blood-Pressure.**—Wheelon found by experimentation that removal of the testes is followed by a slight fall in blood-pressure, while vasomotor reactions to epinephrin remain unchanged. Blood-pressure reactions to nicotin are constantly lowered as a result of gonadectomy, therefore, the effects of castration are on the sympathetic nervous system proper. The lowered irritability of the sympathetic system may partially account for the dispositional changes in castrated dogs. Incomplete data indicate that irritability of the sympathetic nervous system is increased in castrated dogs by the presence of testicular transplants. It is, therefore, concluded by Wheelon that a relationship exists between the normal functioning testes and irritability of the sympathetic nervous system proper.

20. **Heat Production in Smooth Muscle.**—When stimulating smooth muscle indirectly the results obtained by Snyder were uniformly constant in the absence of any measurable amounts of heat production accompanying development of tension. When stimulating by the direct method, by the same apparatus, development of tension in smooth muscle was accompanied now with positive heat changes, now with negative heat changes. But the same apparatus when measuring heat changes in dead muscles (heated electrically), or in live cross-striated muscle stimulated directly gave quite uniform and positive results.

21. **Effect of Pituitary Extract on Secretion of Milk.**—In a young, healthy, married woman, nursing her second baby, in the fifth month of lactation, the injection of 1 c.c. of pituitrin, equivalent to 20 mg. of dried infundibular portion of the gland, was followed, in ten minutes, by a marked increase in the amount of milk secreted. After a latent period of from twenty to thirty seconds the mother could feel the milk "coming into the breasts," and a few minutes later abdominal pains were experienced, presumably due to increased intestinal peristalsis. The milk withdrawn after injection was rich in fat, the average figure for the three experiments being 5.5 per cent. as compared with 3.4 per cent. for three days when no pituitrin was administered. In the milk yielded twenty-four hours after injection the fat content was still somewhat above the normal. Although no quantitative estimations were made, judging from the mother's experience in nursing the child, Hill and Simpson believe that the quantity of milk obtainable by it on the morning after the injection was diminished.

American Journal of Roentgenology, Detroit

July, I, No. 9, pp. 331-360

22 *New Applications of Artificial Pneumothorax as Therapeutic Measure. K. Dunham, Cincinnati.
23 *Indications Afforded by Roentgen Rays for and Against Operations on Stomach. Results Obtained from Such Operations. A. H. Pirie, Montreal.

22 and 23. Abstracted in THE JOURNAL, Nov. 8, 1913, pp. 1743 and 1744.

Annals of Surgery, Philadelphia

October, LX, No. 4, pp. 409-536

24 Principles of Operative Treatment of Diseases of Large Intestine. W. A. Oppel, St. Petersburg.
25 Primary Sarcoma of Lower End of Femur Involving Synovial Membrane. S. F. Jones and R. C. Whitman, Denver.
26 Treatment (Fibrolysin) for Old Contracted Cicatrices. E. G. Alexander, Philadelphia.
27 *Laminectomy for Spinal Tumor. C. A. Elsberg, New York.
28 Aneurysm of Sciatic Artery. R. C. Bryan, Richmond, Va.
29 Case of Disappearance of Recurrent Mammary Carcinoma After Removal of Ovaries. F. Torek, New York.
30 Injuries of Great Toe Sesamoids. K. Speed, Chicago.
31 *Free Transplantation of Fascia Lata. A. T. Mann, Minneapolis.
32 Analysis of Treatment of Fracture of Neck of Femur. R. Whitman, New York.
33 Flashlight Autochrome Photography of Pathologic Subjects. H. H. Hart, Baltimore.

27. **Laminectomy for Spinal Tumor.**—In Elsberg's experience the danger of a laminectomy for spinal neoplasm is small; the results that may be expected from the removal of intramedullary tumors of the cord are fairly good, if the tumors are well localized and will extrude; the results from the removal of extramedullary growths are very satisfactory if only the patients come to operation early enough, before irreparable damage has been done to the cord.

31. **Free Transplantation of Fascia Lata.**—Mann urges the use of transplanted fascia in the routine of practical surgical work, to add strength and to supply defects in ventral and inguinal hernia. Plastic flaps in these cases can do much, but often they can be greatly strengthened or can be replaced by a strong fascial transplant such as may easily be taken from the iliotibial band of the fascia lata.

Archives of Pediatrics, New York

September, XXXI, No. 9, pp. 641-720

34 Some Points of Contact Between Tuberculosis Work and Pediatrics. W. C. White, Pittsburgh.
35 *Endocarditis in Children. F. M. Crandall, New York.
36 Spasmophilia. H. Reye, Ann Arbor, Mich.
37 Psychopathic Child. F. J. Farnell, Providence, R. I.
38 Chronic Infective Endocarditis. E. C. Jones and B. M. Meine, Philadelphia.
39 *Caloric Value of Diets of Sick Infants. J. C. Gittings, Philadelphia.
40 Hemimelia Thoracica. F. L. Wachenheim, New York.

35. Abstracted in THE JOURNAL, June 20, p. 1989.

39. Abstracted in THE JOURNAL, July 4, p. 55.

Boston Medical and Surgical Journal

October 8, CLXXI, No. 15, pp. 545-580

41 Epidemic of Paratyphoid at Boston State Hospital, 1910, M. M. Canavan, Boston.
42 Clinical Features of an Outbreak of Paratyphoid, M. E. Gill-Noble, Boston.
43 Blood-Cell Picture in Paratyphoid and After Vaccination with Bacillus Typhosus. M. M. Canavan, Boston.
44 Relation of Paratyphoid to Antityphoid Vaccination. M. M. Canavan, Boston.
45 Conclusions from Work on Paratyphoid Epidemic at Boston State Hospital, 1910. E. E. Southard, Boston.

October 15, No. 16, pp. 581-620

46 Roentgenologic Consideration of Relation of Individual Type to Intestinal Stasis. P. Brown, Boston.
47 Study of Cancer. S. W. Little, Rochester, N. Y.
48 Gunshot and Bayonet Wounds of Stomach. C. G. Cumston, Geneva, Switzerland.
49 Several Practical Features Associated with Management and Treatment of Obscure Arthritis. H. W. Marshall, Boston.
50 Thyroid Operations Under Local Anesthesia. F. H. Lahey, Boston.

Canadian Medical Association Journal, Toronto

October, IV, No. 10, pp. 853-948

51 Vascular Crises and Angiospasm. A. Birt, Halifax, N. S.
52 *Paroxysmal Tachycardia. W. F. Hamilton, Montreal.
53 Investigations of Semicircular Canals and Their Clinical Applications. D. H. Ballon, Montreal.
54 Medical Profession of Alberta and Defense of Country. L. Drum, Ottawa.
55 National Defence and Medical Profession. S. W. Hewetson, Calgary, Alta.
56 Antityphoid Inoculation at Winnipeg General Hospital. S. J. S. Peirce, Winnipeg, Man.
57 Subtrochanteric Fracture of Femur. W. G. Anglin, Kingston.
58 Case of Tetanus. Treated by Phenol Injections. Recovery. J. T. Fotheringham, Toronto.

52. **Paroxysmal Tachycardia.**—While the 4 cases reported by Hamilton terminated fatally, one patient seems to have been helped by taking large doses of nux vomica. At all events the interval between attacks was lengthened during treatment. While the attacks were brief they seemed trifling; but with short intervals and protracted tachycardia, to say nothing of advancing age, the gravity increased. The treatment, Hamilton says, resolves itself, therefore, in many cases into the treatment of such conditions after the normal rate is approached or reached.

Colorado Medicine, Denver

September, XI, No. 9, pp. 327-360

59 *Some of Professional Responsibilities of Physicians of Colorado. O. M. Gilbert, Boulder.
60 Some Recent Contributions in Field of Microbiology. H. Noguchi, New York.
61 Two Cases of Sphenoid Disease with Brain Symptoms. A. R. Solenberger, Colorado Springs.

59. Abstracted in THE JOURNAL, October 3, p. 1229.

Delaware State Medical Journal, Wilmington

August, V, No. 9, pp. 1-26

62 Surgery for Handicapped Patient. W. E. Bird, Wilmington.

Iowa State Medical Society Journal, Washington

October, IV, No. 4, pp. 271-345

63 Benign Tumors of Breast. O. J. Fay, Des Moines.
64 Malignant Tumors of Breast. D. C. Brockman, Ottumwa.
65 Elephantiasis. Report of Case. C. L. Campbell, Atlantic.
66 Pellagra. A. H. Jastram, Remsen.
67 Adhesive Complications of Right Abdomen. M. Emmert, Atlantic.
68 Brain Localization. E. M. Williams, Sioux City.
69 Cancer of Uterus. C. S. James, Centerville.

Journal of Experimental Medicine, Lancaster, Pa.

October, XX, No. 4, pp. 321-432

70 *Relation of Bacteriolysis to Proteolysis. J. W. Jobling and W. Petersen, New York.
71 *Chemistry of Serous Effusions. A. A. Epstein, New York.
72 Pneumococcus Hemotoxin. R. Cole, New York.
73 *Production of Methemoglobin by Pneumococci. R. Cole, New York.
74 *Rôle of Spleen in Blood Formation. D. H. Morris, New York.
75 *Immunization of Animals with Bacterial Proteotoxins (Anaphylatoxins). H. Zinsser and J. G. Dwyer, New York.
76 *Rôle of Lymphoid Tissue in Resistance to Experimental Tuberculosis in Mice. J. B. Murphy and A. W. M. Ellis, New York.
77 *Cause of Localization of Secondary Tumors at Points of Injury. F. S. Jones and P. Rous, New York.
78 Greater Susceptibility of an Alien Variety of Host to an Avian Tumor. P. Rous and L. B. Lange, New York.
79 Immunity to Transplantable Chicken Tumors. P. Rous and J. B. Murphy, New York.

70. **Relation of Bacteriolysis to Proteolysis.**—According to Jobling and Petersen there is no demonstrable increase in non-coagulable nitrogen during bacteriolysis. Bacteria treated with immune serum and complement are so altered that they are more readily digested by trypsin. Bacteria treated with complement alone become more resistant to proteolysis. Bacteria treated with an excess of immune serum and complement become more resistant to proteolysis.

71. **Chemistry of Serous Effusions.**—The fluids subjected to analysis by Epstein are grouped according to the following scheme, which is based on clinical data: 1. Cutaneous effusions: (a) nephritic and (b) cardionephritic. 2. Pleural effusions: (a) inflammatory and (b) non-inflammatory including (1) nephritic, (2) cardiac, (3) cardionephritic and (4) new growth. 3. Abdominal effusions: (a) inflammatory, tuberculous and (b) non-inflammatory, including (1) new growth, (2) cirrhosis of the liver, (3) cardiac and (4) cardionephritic. 4. Hydrocele fluid. A comparison of the results obtained shows that the effusions vary, (1) according to location, and (2) according to the disease in which they are produced. Thus the subcutaneous effusions are totally different in their composition from the abdominal or pleuritic fluids; and again the abdominal fluid of nephritic origin is different from those of cardiac or other origin.

The cutaneous effusions are characterized by a low protein content and a small amount of incoagulable nitrogen. Of the protein present in these fluids, the globulin constitutes the greater portion. In the mixed cardionephritic fluids the ratio of globulin to albumin is lower than that in normal blood-serum; but when compared with the blood-serums of cardionephritic cases there appears to be a certain parallelism. The chlorid content of these fluids is considerably above that found in normal blood-serum, but is comparable with those of corresponding cases. The effusions occurring in serous cavities differ from the cutaneous ones by their higher protein content. The highest values are attained in the pleural fluids, in which the protein present is almost the same as that in normal blood-serum. The incoagulable nitrogen in these fluids is uniformly low. The chlorids vary in amount according to the nature of the case. In the effusions of inflammatory origin the values are lower than those found in the blood. In the pleural fluids of other than inflammatory origin the chlorid content is either the same or higher than that of blood-serum. The globulin-albumin ratio in all of these fluids is higher than that of normal blood-serum. The abdominal fluids in general are less rich in protein than the pleural effusions. Those of cardiac origin give the highest protein values, but the globulin-albumin ratios are lower than in the pleural fluids or in the blood-serums of corresponding cases. The results obtained in the analysis of abdominal fluids from cardionephritic cases approach very closely those obtained in purely cardiac cases.

73. **Production of Methemoglobin by Pneumococci.**—Cole found that living pneumococci in contact with hemoglobin transform this into methemoglobin. The reaction does not occur when hemoglobin is added to an emulsion of washed pneumococci in salt solution. However, if minute traces of dextrose be added to such a mixture, the reaction quickly occurs. The dextrose may be replaced by any one of a number of other sugars, and also by certain other organic substances, if the latter are added in large amounts. The reaction does not occur in the absence of oxygen. If the free oxygen be first removed, and then replaced, the reaction occurs more rapidly than if the oxygen had not been removed. The presence of free oxygen in excess slightly delays the reaction, possibly because of the inhibition of the reduction process which forms the first part of the reaction. The explanation of this phenomenon of methemoglobin production is not only of importance so far as this special reaction is concerned, but also because it suggests an explanation for the manner in which pathologic effects are produced by those bacteria which apparently produce no soluble toxin.

74. **Rôle of Spleen in Blood Formation.**—Morris examined carefully the blood entering the spleen and compared it with that emerging by the splenic vein. His results all point to the inevitable conclusion that the spleen is a blood-forming organ of prime importance in the animal metabolism. The fact that the organ can be extirpated without causing death or even considerable detriment to the animal organism does not militate against this conclusion. Other organs (hemolymph nodes, bone marrow, and adenoid tissues in general) may assume part of the rôle of the spleen when this is absent, but only the severity of the blood-destroying agent and the individual resistance can determine whether the body can stand the strain when deprived of the spleen. Cases of death from removal of the malarial spleen indicate this strongly.

75. **Immunization of Animals.**—The authors' experiments show that guinea-pigs, once injected with sublethal doses of bacterial proteotoxins (anaphylatoxins), acquire distinct tolerance to these poisons. The degree to which such resistance or tolerance is developed is never high, in no case exceeding the ability to withstand one and one-half to twice the fatal dose of the poisons. During the three or four days immediately following the first injection the animals appear to be slightly less resistant than are normal controls, this depending probably on the injury done by the administered poison. Tolerance begins to be evident after from four to seven days, seems to be most highly developed in about two weeks, but lasts in a diminishing degree for at least as long as sixty days.

76. **Resistance to Experimental Tuberculosis in Mice.**—Murphy and Ellis state that mice either normal or splenectomized after exposure to the Roentgen ray are markedly more susceptible to bovine tuberculosis than are normal animals. Animals splenectomized a short time prior to inoculation are also more susceptible than normal, while those splenectomized eight to ten days before inoculation have about the same resistance as normal. The mice splenectomized three to four weeks before inoculation have a resistance increased over the normal, as has already been shown by Lewis and Margot. As Roentgen ray in the doses used apparently affects only the lymphoid tissue and as the hypertrophy of the remaining lymphoid tissue after splenectomy is so rapid that the circulating lymphocytes may be much above the normal by the third week, it is concluded that this evidence, taken with the well-known association of the lymphocytes with tuberculous lesions, points strongly to the lymphocyte as an important agent in the defensive mechanism against tuberculosis.

77. **Localization of Secondary Tumors.**—Jones and Rous found that the injection of a suspension of mouse tumor into a healthy peritoneal cavity has little success as a rule compared with a similar injection into the subcutaneous tissue. They found that the resistance of the peritoneal lining thus

indicated can be abolished largely if not completely by the preliminary injection of a mechanical irritant (lycopodium). That the change thus brought about is independent of general immunity phenomena is shown by the fact that a local injury renders susceptible the part of the peritoneum immediately affected and that part only. Special tests show that the factor important in rendering the peritoneum more susceptible is the injury to the subendothelial connective tissue. Susceptibility persists after the endothelium has regenerated over the reacting connective tissue.

Schmidt found that the cells of tumor emboli in the pulmonary arterioles are able to penetrate the endothelium of the vessel only after they have been provided with a stroma from the subendothelial connective tissue. Jones and Rous claim that a connective tissue highly cellular and perhaps still proliferating as the result of injury may well elaborate the stroma for a tumor more rapidly than normal connective tissue. Tests of growth in vitro support this idea. Connective tissue reacting to an injury grows profusely and almost immediately when incubated in plasma, whereas normal tissue from the same region shows usually no growth whatever. Dead tumor fragments in contact with the peritoneum cause a change favorable to the lodgment and growth of later tumor fragments.

Jones and Rous suggest that it seems not improbable that the peritoneal dissemination of certain human neoplasms may be accomplished indirectly through the death of the first tumor fragments cast off. They conclude that the secondary localization of tumors at points of injury may be attributed with good reason to the presence at such points of an active connective tissue capable of elaborating a stroma rapidly and abundantly. For it is the proliferation of the subendothelial connective tissue to form a supporting stroma that determines the fate of free tumor cells, whether these lie on the peritoneum or within a vessel.

Lancet-Clinic, Cincinnati

October 10, CXII, No. 15, pp. 385-412

80 Effects of Alcohol and Tobacco on Life Expectancy. T. D. Crothers, Hartford, Conn.
81 Recognition of Defensive Ferments in Urine. B. Holmes, Chicago.
82 Applied Physical Chemistry in Heart Disease. J. Aulde, Philadelphia.
83 Whitehead Operation for Hemorrhoids. C. E. Caldwell, Cincinnati.
84 Light: Its Use and Abuse. J. Ranly, Cincinnati.

Medical Record, New York

October 17, LXXXVI, No. 16, pp. 657-698

85 Means by Which Infectious Diseases Are Transmitted and Disinfection. A. H. Doty, New York.
86 *Chronic Mucous and Membranous Colitis. G. M. Linthicum, Baltimore.
87 Roentgenographic Diagnosis of Enlargement of Thymus. D. B. Delavan, New York.
88 Alcoholism as Factor in Disease. D. Carter, New York.
89 Diagnosis of Typhoid. G. A. Rueck, New York.
90 Syringomyelia; Report of Case of Morvan's Type of Disease. H. V. Wildman, Jr., New York.
91 Rhinolith of Several Years' Duration in Child of Eight. B. Joseph, New York.

86. **Chronic Mucous and Membranous Colitis.**—The neurotic theory of these conditions is upheld by Linthicum. He has adopted a method of treatment which, he says, has given him very encouraging results in all cases in which there were no outside factors in the abdominal cavity which would keep up an irritation of the colon or rectum, or in which it was secondary to heart, liver or kidney involvement. The method used in treating these cases has been by fuming crystals of iodin, or one of its salts, forcing the fumes into the rectum and colon with slight pressure. The apparatus consists of an ordinary 500 c.c. Florence flask, with a double perforated rubber stopper connected with pressure tank or bulb on one side, the glass tube entering into and extending to about 2½ cm. from the bottom of the flask, an exit being provided by a right angle glass tube with its inside end close to the top. The exit is connected with a short glass tip by a rubber tube about 25 cm. long. The patient, if a man, is placed in the knee-chest position and, the proctoscope being introduced, the gas is blown through it into the bowels until the patient complains of cramps or too much distress. (If the patient is a woman she is placed in the Sims position.) The air is then allowed to escape and the insufflation is repeated, so that altogether the vapor from 2 gm. of iodin crystals or 1½ gm. of iodoform, is used. The iodin is fumed by means of a small electric stove, placed under the flask; a bunsen burner or an alcohol lamp can be used.

The glass tip inserted through the anus a few centimeters may be used without the use of the proctoscope in cases in which the patients grow weary of its insertion; but the proctoscope aids dilatation. In the early stages of the disease this treatment is given each day for a period of ten days, and then at less frequent intervals so that the treatment extends over a period of six to eight or twelve weeks. The result has been that the constipation was relieved and the patient had regular normal stools. The mucous membrane assumed a more nearly normal appearance, and the mucous secretion ceased. The preliminary treatment before the injection consists of the patient irrigating his bowels thoroughly, so that he presents a clean intestine each time before his regular treatment.

New York Medical Journal

October 10, C, No. 15, pp. 697-744

92 Technic of Spinal Anesthesia. W. W. Babcock, Philadelphia.
93 *Continuous Uterine Drainage. A. E. Gallant, New York.
94 Cervical Adenitis. N. P. Stauffer, Philadelphia.
95 Present Status of Verumontanum in Deep Urethral Diseases. J. A. Hawkins, Pittsburgh.
96 Acquired Organic Hour-Glass Stomach. G. A. Humphreys, New York.
97 Modern Treatment of Bright's Disease. J. Herold, New York.
98 Substitution Reactions. C. P. Oberndorf, New York.
99 Gonorrheal Stomatitis. H. J. Farbach, Louisville, Ky.
100 Present Status of Functional Liver Tests. E. B. Krumbhaar, Philadelphia.

October 17, No. 16, pp. 745-796

101 Implantation of Generative Glands and Its Therapeutic Possibilities. G. F. Lydston, Chicago. (To be continued.)
102 Case of Heteroplastic Grafting of Testicle. R. T. Morris, New York.
103 Gunshot Wounds of Spine. C. G. Cumston, Geneva, Switzerland.
104 Median Bar Obstruction in Prostatic Disease. Report of Case. J. D. Whitall, Philadelphia.
105 Was the Engineer's Mind Impaired by Alcohol? T. D. Crothers, Hartford, Conn.
106 Localization of Brain Lesions. H. Crenshaw, Atlanta, Ga.
107 Nasopharyngoscope in Treatment. T. J. Harris, New York.
108 Alleged Tuberculosis Cures on the Market. F. P. Morgan, Washington, D. C.
109 Tropeolin as an Indicator for Gastric Acidity. F. W. Rolph, Toronto, Canada.
110 *Purpura Hemorrhagica Treated with Horse-Serum. J. M. Bodenheimer, Shreveport, La.

93. **Continuous Uterine Drainage.**—Normally, Gallant states, the menstrual blood condenses in the passive uterus, escapes drop by drop, or trickles from the os externum in a bright red, intermittent stream, without malaise, pain, headache, or any sort of reflex manifestation. Obstruction to the free outflow may be caused by fibrosis, cicatrization, flexure, neoplasm of any portion of the cervical canal or involving the lower uterine zone. Obstruction is primarily an intermenstrual condition, which (a) causes retention of mucus, etc., within the uterus; (b) retards the outflow of menstrual blood; and (c) shuts in the dangerous remnants after abortion, miscarriage, and labor, and the gonococcus. Obstruction excites the uterus to laborlike activity, brings about hypertrophy of its wall, enlargement of its cavity, increased weight, and an abnormal condition of its mucous membrane. Obstruction during menstruation causes colicky cramps, laborlike pains, backache, headache, and other reflex pains; (b) obstruction during labor causes serious dystocia; (c) obstruction after labor induces after-pains, facilitates infection, and favors subinvolution; (d) obstruction between periods, intermenstrual, forces infection into the tubes and peritoneum, and results in peritonitis, tubal gestation, hydrosalpingitis and pyosalpingitis, and, by thus obstructing the tubes, is the most common cause of sterility, and frequently is at the bottom of marital infelicity, leading to the divorce courts and the hospital, and if the woman escapes with her life, she will be compelled to live an aphoric life, subsisting on the alimony which the courts offer as her only means of redress. Obstruction in young or older women can be and should be remedied, by dilatation, drainage, replacement, pessary support, or suspension of the uterus.

Continuous efficient drainage can be secured only by the use of a drain which will permit the cervical mucus to pour into the drain, mingle with the secretions, and prevent clotting and plugging. To prevent recontracture of the internal os, reflexure of the anteflexion, the drain must be of rubber, fenestrated or perforated, sutured in the cervix and must remain *in situ* for six or more months. Experience teaches that, except for the removal of detached secundines or placenta, curettage is unwise and can therefore be dispensed with.

To secure uninterrupted drainage from the uterine cavity in acute cases, Gallant advises that a gauze roll wick should be placed in the vagina, with its upper end under the drain and the lower end projecting through the vulva so as to come in actual contact with the vulva pad, otherwise pus will collect in the vagina and sapremia will result.

110. **Purpura Hemorrhagica Treated with Horse Serum.**—In Bodenheimer's case good results were obtained from this treatment. Ten c.c. of horse serum were administered intramuscularly. Calcium lactate in 2 grain doses every two hours, and gelatin and orange juice freely, was administered by mouth. The hemorrhagic blisters in the mouth, which on close inspection proved to be gangrenous, showed a marked improvement in twenty-four hours after the administration of the horse serum; in fact, they acted as remarkably as the diphtheritic membrane does after the administration of diphtheria antitoxin. The epistaxis ceased, but the bloody stools continued. In forty-eight hours the blisters or gangrenous spots in the mouth, which had been at least 1/25 of an inch in diameter, were practically well. The bloody stools continuing 10 c.c. more of horse serum was administered and the treatment by mouth continued.

The stools were markedly improved in the next twenty-four hours, and after two or three days were normal. The treatment by mouth was continued for a week and the child carefully nourished. She was watched for some time, but up to the present, three months having passed, there has been no return of symptoms.

She had the not unusual urticaria ten days after the serum administration, but outside of the usual parental alarm and discomfort to the patient, the recovery was uneventful.

New York State Journal of Medicine

October, XIV, No. 10, pp. 471-511

111 Diagnosis of Nervous Diseases. C. L. Dana, New York.
112 Some Manifestations of Influenza in Young Children. L. E. Holt, New York.
113 Recurrent Bronchitis in Children. C. G. Kerley, New York.
114 Effect on Subsequent Labors of Operations for Uterine Displacements. G. W. Kosmak, New York.
115 Experimental Study of Ocular Anaphylaxis. M. J. Schoenberg, New York.
116 Effects of Sugars on Gastric Secretions in Infants. D. H. Sherman and H. R. Lohnes, Buffalo.

Northwest Medicine, Seattle, Wash.

October, VI, No. 10, pp. 291-324

117 Sliding Hernia. P. Rockey, Portland, Ore.
118 Value of Nerve Blocking in Prevention of Surgical Shock. E. O. Jones, Seattle.
119 Conservation of Vision. J. L. McCool, Portland, Ore.
120 Extension Treatment of Fractures of Neck of Femur in Reference to Its Occurrence in Elderly Subjects. J. A. Pettit, Portland, Ore.
121 Appendicitis in Early Childhood. J. B. Manning, Seattle.
122 Diagnosis in Early Stages of Urinary Tuberculosis. G. S. Whiteside, Portland, Ore.

Ohio State Medical Journal, Columbus

October, X, No. 10, pp. 575-646

123 Sex Hygiene an Educational Problem. H. Jones, Circleville.
124 Case of Abnormal Fetus. W. A. Cromley, Palestine.
125 Diagnosis and Prognosis of Insanities. E. E. Gaver, Columbus.
126 Mental Symptoms Due to Brain Tumor. W. B. Laffer, Cleveland.
127 Practical Value of Routine Bacteriologic Examinations of Conjunctiva. W. H. Snyder, Toledo.
128 Operative Aspects of Certain Static Foot Troubles. A. H. Freiberg, Cincinnati.
129 Atrophic Rhinitis with Ozena: Etiology and Surgical Treatment. H. B. Harris, Dayton.

Oklahoma State Medical Association, Muskogee

October, VII, No. 5, pp. 139-171

130 Prognosis and Treatment of Injuries of Central Nervous System with Reference to Trauma. R. Grosshart, Tulsa.
131 Surgery and Prognosis of Gall-Bladder and Ducts. H. A. Lile, Aline.
132 Headache of Nasal Origin. E. F. Davis, Oklahoma City.
133 Early Diagnosis of Insanity. A. A. Thurlow, Norman.
134 Spinal and Local Anesthesia in Gynecologic and Obstetric Surgery. E. L. Gilcreest, Gainesville, Tex.

Ophthalmic Record, Chicago

October, XXIII, No. 10, pp. 487-540

135 Case of "Squirrel Plague" Conjunctivitis in Man. D. T. Vail, Cincinnati.
136 Treatment of Earlier Stages of Senile Cataract. H. Smith, Amritsar, India.
137 Historic Data Concerning Glasses. E. Hill, Chicago.

Surgery, Gynecology and Obstetrics, Chicago

October, XIX, No. 4, pp. 427-554

138 *Internal Derangements of Knee. R. Jones, England.
139 Operative Treatment of Ankylosis of Mandible. V. P. Blair, St. Louis.
140 Treatment of Inoperable Carcinoma of Uterus by Application of Heat. J. F. Percy, Galesburg.
141 Results of Radical Operative Treatment of Cancer of Uterus. T. Wilson, England.
142 *Ulcer of Stomach in Children Before Puberty. C. D. Lockwood, Pasadena, Cal.
143 *Postoperative Pleurisy with Effusion and Empyema. A. C. Burnham, New York.
144 Intestinal Obstruction Due to Cancer of Colon. A. McGlannan, Baltimore.
145 Strictures of Gall-Bladder. J. E. Else, Portland, Ore.
146 Inversion of Uterus. M. J. Buck, Pittsburgh.
147 Case of Sporotrichosis. B. F. Davis, Chicago.
148 *Spinal Anesthesia in Gynecology. G. Gellhorn, St. Louis.
149 *Study of End-Results of Interposition of Uterus. J. O. Polak, Brooklyn.
150 Behavior of Abdominal Cutaneous Reflexes in Acute Conditions within Abdomen and Pelvis. R. R. Smith, Grand Rapids, Mich.
151 *Eruptions Following Operation. F. B. McCarty, Chicago.
152 *Can Surgery Be Eliminated in Treatment of Fibroid Tumors of Uterus? J. A. McGlinn, Philadelphia.
153 Strangulated Epigastric Hernia. A. V. Moschcowitz, New York.
154 *Untoward Results of Pyelography. M. Krotoszyner, San Francisco.
155 *Treatment by Cautery of Gastric Ulcer. D. C. Balfour, Toronto.
156 *Autoplastic Bone Grafting. J. F. Oechsner, New Orleans.
157 *Concerning Renal Lesions After Pyelography. L. Buerger, New York.
158 *Immediate Bone Transplantation in Compound Comminuted Fracture of Tibia and Fibula. W. S. Barnes, Chicago.
159 Uses of an Arm-Board in Surgery. G. G. Turner, England.
160 *Treatment of Cranial Defects by Bone-Grafts. R. L. Rhodes, Roanoke, Va.
161 Pulmonary Abscess. A. H. Pirie, Montreal.

138. **Internal Derangements of Knee.**—Also published in the London *Lancet*, August 1 and abstracted in THE JOURNAL, August 29, p. 808.

142. Abstracted in THE JOURNAL, January 31, p. 405.

143. **Postoperative Pleurisy with Empyema.**—Burnham claims that pleural effusion is not of uncommon occurrence after operations, and may occur at any time, but is most often seen before or shortly after the subsidence of the postoperative temperature. It is most frequently seen after septic abdominal conditions, and is usually on the right side. A clear serous exudate in the right chest is not necessarily a serious complication, such cases usually going on to recovery. In so far as they refer to postoperative conditions, Burnham says, that Gee and Harder's statement that "pleural effusion following abdominal infection is more often purulent than serous" is not borne out by case records. There is a distinct clinical type of empyema which may complicate abdominal infections either before or after operations, and the case mortality of this type is high. The relationship which exists between perforated gastric ulcer, subphrenic abscess, and empyema is exceedingly close; and the occurrence of one of these conditions, without apparent cause, should lead to a suspicion of one or both of the others. A turbid or purulent effusion occurring in the right chest, following laparotomy, requires immediate drainage, and should lead at once to the exploration of the subphrenic space.

148. Abstracted in THE JOURNAL, June 27, p. 2047.

149. Abstracted in THE JOURNAL, June 20, p. 1988.

151. **Eruptions Following Operation.**—Eruptions following operation were found by McCarty to be of comparatively frequent occurrence, particularly after operations on parts abundantly supplied with sympathetic nerve fibers, as the pelvic organs, in which they occurred in 4½ per cent. of a series of 1,000 cases. These eruptions occur after any of the

common anesthetics—ether, chloroform, or nitrous oxid. The condition is characterized by an interval between operation and onset of eruption, by lack of prodromata or of constitutional symptoms, by the presence of an erythematous or papular eruption with severe itching, and by the presence of an elevated temperature and moderate leukocytosis. The eruption often simulates scarlatina, measles, and the so-called drug exanthems. The exciting cause varies; drugs, enemata, anesthetics, and operative shock are included. The underlying cause is a vasomotor disturbance due probably to irritation of the sympathetic nervous system.

152. **Fibroids of Uterus.**—McGlinn says that surgery is the best treatment in fibroid tumors of the uterus and cannot be supplanted by any other known form of treatment, although roentgenotherapy has an important place in the treatment of these tumors. Surgeons and roentgenologists should not enter into competition with each other but should work hand in hand for the relief of womankind.

154. **Untoward Results of Pyelography.**—Krotoszyner would restrict pyelography to those comparatively rare cases in which the correct recognition of a renal lesion by a combination of all other exact methods of examination is impossible.

155. **Treatment by Cautery of Gastric Ulcer.**—The following technic described by Balfour has been employed in the cases thus far operated on in the Mayo clinic. The portion of the gastrohepatic omentum in the region of the ulcer is carefully dissected free from the lesser curvature. The ulcer is carefully palpated and with a Paquelin cautery maintained at a dull heat the point is slowly carried through the ulcer until an artificial perforation is produced. The moderate burning is continued until the actual area of the ulcer is entirely destroyed. Closure of the opening is then made by interrupted sutures of chromicized catgut reenforced by mattress sutures of silk. The reflected gastrohepatic omentum is then replaced over the site of the ulcer and fixed by superficial interrupted sutures of fine silk. In the application of this method the following facts are apparent: 1. The ulcer is destroyed and with it any early malignancy which may exist. 2. There is little sacrifice of sound gastric tissue, and secondary contraction is therefore minimized. 3. Hemorrhage, early or late, is with practical certainty prevented. 4. Its simplicity, speed of accomplishment and safety.

156. Abstracted in THE JOURNAL, May 30, p. 1748.

157. **Renal Lesions after Pyelography.**—In December, 1911, on examining a kidney removed two weeks after collargol pyelography, Buerger found distinct evidences of necrosis due to collargol in the renal parenchyma. Since then he used argyrol almost exclusively in this work, hoping that it might be less dangerous and less destructive of the renal tissue, even if it should penetrate into the renal parenchyma. A few months ago, a case was encountered in which extensive necrosis occurred in a hydronephrotic kidney after the injection of argyrol into its pelvis.

158. **Comminuted Fracture, Fragments Used for Transplant.**—Barnes cites a case, patient aged 59, of compound comminuted fracture of the left tibia and fibula about 2 inches above the ankle joint, with several spicula of bone protruding through the skin. The fibula was fractured about 2 inches above the tip of the malleolus. The upper fragment was overriding the lower fragment for a distance of about an inch. The tibia was comminuted about 2½ inches above its lower articular surface for a distance of about 5 inches. The bone was partially splintered, and the fragments were in malposition to the shaft of the bone as well as with each other. All the fragments were removed. One fragment, which measured 5½ inches in length and about the thickness of an ordinary sized man's little finger, was placed in sterile salt solution. It was sufficiently long to span the gap between the two tibia fragments. It was carefully trimmed so that all the ragged edges were smooth, and placed in the gap between the fragments, each end resting securely in the medullary canal of the fragment. Nothing was done with the fibula. The fragments were in good apposition.

Nine weeks after the operation the leg and foot were plumb, the fibular fragments had united firmly, the transplant was doing its work well and union had already taken place between the ends of the transplant and the tibia. Eighteen weeks after the operation the union between the tibia and the transplant was firm and complete and was still progressing. Seven months after the operation regeneration of bone was still taking place. The transplant is disappearing by absorption and new bone is taking its place.

160. **Treatment of Cranial Defects by Bone-Grafts.**—Rhodes cites four cases in which a rectangular piece of bone large enough to cover the cranial defect was in each case taken from the flat surface of the tibia along with the periosteum covering and slightly larger than the graft and placed over the defect and anchored in position by sewing the periosteum of the graft to that of the skull with chromic catgut.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

October 3, II, No. 2805, pp. 565-608

1 *Surgical Treatment of Nephroptosis by Occlusion of Perinephric Fascial Sac (Capsular Occlusion). C. B. Lockwood.
2 Use of an Aperient before Roentgenoscopy of Intestine in Chronic Constipation. R. Gompertz and M. Scott.
3 Insects and War: Fleas. A. E. Shipley.
4 Bacilli and Bullets. W. Osler.
5 Case of Ruptured Ectopic Gestation Complicated by Splenomedullary Leukemia. L. E. Sutcliffe.
6 Thymus Gland in Its Clinical Aspects. A. E. Garrod.
7 Technic of Thymectomy. Report of Eight Cases. A. MacLennan.
8 Appendicitis and Status Lymphaticus. D. P. D. Wilkie.
9 Association of Fulminant Pneumonia and Scrofula with Status Lymphaticus. C. McNeil.
10 *Headache, Its Causes and Treatment. H. Campbell.
11 *Acute Atrophy of Thyroid. F. C. Eve.
12 Case of Anemia with Enlargement of Spleen; Splenectomy; Cure. J. S. McKendrick.
13 Urinary Diastase Test in Case of Ruptured Duodenum. A. H. Lister.

1. **Treatment of Nephroptosis by Capsular Occlusion.**—The perinephric fascia not only restrains the movements of the kidneys during ordinary respiration but also during respiratory efforts and during joltings and shakings of the body. When the kidney becomes loose the perinephric fascia does not yield at its attachments. Its sac becomes too capacious, and then the kidney begins to have a wide range of movement within it. On this basis Lockwood treats loose kidneys by occluding the loose and too capacious perinephric sac or bag. An oblique incision is made about an inch below the twelfth rib, in the direction of the fibers of the external oblique, beginning behind at the outer border of the erector spinae, and extending forward for 4 or 5 inches. No nerves are divided, and the bleeding is trifling. The fascia transversalis having been opened, the finger is passed over the kidney to separate the perinephric fascia from the colon and peritoneum, and the perinephric fascia is taken between the finger and thumb at the lower end of the kidney, which is squeezed upward within the sac. When the kidney has gone up as high as is judged necessary, the perinephric fascia is clamped at its lower end with pressure forceps and ligatures of No. 2 and 3 twisted silk are passed round it with a curved needle. The ends of these ligatures are left long and used to fix the perinephric fascia to the abdominal wall. Before applying the pressure forceps the perinephric fascia is felt between the finger and thumb to make sure that the ureter is not being taken in. When the perinephric fascia has been ligatured the lower end of the kidney is at about the level of the twelfth rib and moving a little with respiration. Lockwood says that unless it is necessary to explore the kidney it is better not to open the sac of the perinephric fascia. The operation is completed by bringing the abdominal muscles together with chromic gut sutures, and suturing the skin with silkworm gut.

10. **Headache, Its Causes and Treatment.**—The following classification for headache proposed by Campbell though not conforming to the strict requirements of logic, will be found a convenient one for practical purposes: 1. Organic disease of the cephalic structures—for example, meningitis, "rheumatic" effusion into the scalp. 2. External irritation of the cephalic structures—for example, pediculi, traction on the

hair. 3. Irritation in areas other than the cephalic—for example, eye-strain. 4. Circulatory disturbances in the cephalic structures, and morbid states of the blood, causing functional headache. 5. Causes not included under the previous headings—for example, mental causes, physical exercise, atmospheric conditions.

Campbell also suggests that physicians will get far more help by studying man's diet from the point of view of evolution than from laboratory experiments—certainly as regards the main truths, useful as such experiments doubtless are. Primitive man consumed an abundance of animal food; his supply of sugar was limited to wild honey, his starchy food to what he could obtain from the uncultivated animal kingdom; and observe that before the discovery of cookery all this had to be masticated laboriously. Hence it was that primitive man consumed comparatively little starch and such as he did consume was so thoroughly masticated that it was to a large extent predigested in the mouth. In the case of neocivilized man, on the other hand, not only is sugar abundantly consumed, but the stomach (especially during the first years of life) is literally deluged with undigested starch. Such considerations surely suggest that, as regards the diet of our neocivilized patients, we have more to apprehend from an excess of starch and sugar than from an excess of animal food.

11. **Acute Atrophy of Thyroid.**—Eve cites a case of exophthalmic goiter which showed complete disappearance of a rather large goiter during the two days preceding death. That is to say, no trace of it could be detected by the eye or fingers. A post-mortem dissection was unfortunately out of the question.

Journal of Obstetrics and Gynecology of British Empire, London

August, XXVI, No. 2, pp. 75-132

14 *Subdivisions of Chronic Metritis. W. F. Shaw.
15 *Migratory Adenomyomata of Uterus. A. Leitch.
16 Case of Adenomyoma Uteri with Adenomyomata in Fallopian Tube and Sigmoid. W. Gough and C. E. Stewart.
17 Future of Roentgenology in Gynecologic Practice. C. Lockyer.
18 Accidental Hemorrhage with Free Blood in Abdominal Cavity. W. F. Shaw.
19 *An Unusual Complication of Fibroid Tumor in Pregnant Uterus. E. Reid.
20 Case of Superficial Atresia of Vulva in Patient Aged Twenty-Two. J. B. Hellier.
21 Case of Grape-Like Sarcoma of Cervix Uteri. J. B. Hellier.

14. **Subdivisions of Chronic Metritis.**—"Chronic metritis," Shaw states, is a clinical term which is used to designate uteri which are regularly enlarged, firm and cause hemorrhage, pain or leukorrhea. There are at least two classes of chronic metritis: (a) chronic subinvolution; (b) hypertrophy. These two classes can always be distinguished by the arrangement of the elastic tissue. Nulliparous and parous uteri can always be distinguished by the arrangement of the elastic tissue: (a) In a nulliparous uterus the elastic tissue is confined chiefly to the internal elastic lamina of blood-vessels with only thin fibrils in the media, adventitia, and between the muscle fasciculi of the mesometrium; (b) in a parous uterus some thick strands of elastic tissue can always be found surrounding some of the blood-vessels. In the hypertrophic form of chronic metritis the arrangement of the elastic tissue is the same as in a virgin uterus. In the subinvoluted form of chronic metritis large deposits of elastic tissue are found in the walls and around the blood-vessels. The hypertrophic form is primarily due to a hypertrophy of the endometrium which stimulates uterine contraction, and in course of time produces a "work-hypertrophy." The chronic subinvoluted form results after parturition when, from any cause, involution does not occur normally.

15. **Migratory Adenomyomata of Uterus.**—In a case cited by Leitch an adenomyoma having started from the endometrium migrated, or was extruded, through the wall posteriorly; owing to hemorrhage occurring during a menstrual period the serous surface was broken; the loaded and dependent sigmoid colon became adherent to this, the glandular constituents infiltrated the wall of the sigmoid; the adhesion became attenuated by movements of the intestine and at operation the slender adhesion was broken, leaving a discoid portion in the uterus and an abraded area in the colon.

19. **Fibroid Tumor in Pregnant Uterus.**—When about two months pregnant Reid's patient while helping to put down a carpet felt a sudden pain to the right of the pelvis; it was not very severe, but she had to rest awhile. Next day she still had pains, but she was able to take an active part in a whist drive and dance. The following day the pains were worse, and she sent for her physician. The pains increased in severity in spite of rest and palliative treatment; vomiting and inability to sleep added to her distress and her condition was fast becoming somewhat alarming.

On opening the peritoneal cavity 4 to 5 ounces of dark venous blood gushed out, and there were extensive but recent adhesions of parietal peritoneum, omentum and small gut around the tumor. On separating these Reid found a soft fibroid tumor about the size of a fetal head at full term, partially extruded from the uterine wall to the right of the fundus. The rent in the uterus was fully 5 inches long, the edges of the tear were ragged, and there was slight venous bleeding. The fibroid had burst through its capsule, and at least half of it lay external to the uterine wall. The body of the uterus was enlarged and suggested a pregnancy of two or three months' duration. The tumor was easily shelled out, and the bleeding stopped by deep chromic gut sutures inserted to close the rent in the uterus. The abdomen was closed without drainage. On examination after removal the fibroid gave the appearance of being in an early stage of red degeneration. The pain entirely ceased after the operation, and the patient made an excellent and rapid recovery.

Lancet, London

October 8, II, No. 4753, pp. 835-882

22 *Application of Suturing to Vascular System. R. Warren.
23 *Value of Antistreptococcus Sera. J. W. McLeod.
24 Sclerocorneal Trephining. R. H. Elliot.
25 *Electrolytic Prevention of Lead Poisoning. K. Goadby.
26 *Electrolytic Treatment of Lead Poisoning. W. H. F. Oxley.
27 Improvisation of Apparatus in Treatment of Certain Fractures in Modern Warfare. (To be continued). J. H. Watson and T. Snowball.
28 Ambulance Work in France. J. Donelan.

22. **Application of Suturing to Vascular System.**—A case of stab wound of the right ventricle treated by suture is cited by Warren. A male, aged 48, fat and flabby in build, had been stabbed over the heart four hours previously. A small linear wound ¾ inch long (which did not appear to be deep) was found over the precordium, while external bleeding was minimal. The patient complained much of pain over the heart, was pale and anxious, with a small feeble pulse of 120; the area of cardiac dulness was perhaps slightly increased, and the heart sounds were feeble, but no adventitious sounds were heard. From the position of the wound and the amount of shock a diagnosis of hemopericardium was made. The pericardium was explored by turning up a flap of soft parts and removing the cartilages of the fourth and fifth left ribs with half the sternum opposite these. The intercostal and internal mammary vessels were tied and the triangularis sterni displaced. The pericardium was tense, dark in color, and the cardiac impulse obscured. The pericardium was freely opened, much blood escaping, and a wound 1¼ inches long in the anterior surface of the right ventricle was secured with catch forceps and sutured with five stitches of silk. The wound healed by first intention, and with the exception of slight left pneumothorax (due to tearing the pleura at the exploration) and a little femoral thrombosis, uneventfully. The patient was alive and active three years later.

23. **Value of Antistreptococcus Sera.**—McLeod studied this question experimentally and by reviewing the literature as a result he believes that a certain type of streptococcus exists, which is virulent for rabbits and capable, to a peculiar degree, of producing toxin in the body of an infected animal, against which rabbits cannot be readily immunized, and that the serum of a horse treated with injections of these streptococci is not capable even in large doses of conferring passive immunity on the rabbit. None of the serums available is likely to afford a supply of immune opsonin at once adequate in amount and sufficiently adapted to the strain

of streptococcus involved markedly to alter the course of streptococcal infection in man.

In the treatment of severe streptococcal infections normal heated horse-serum, which has been proved slightly superior in the experiments recorded by McLeod, and which would in any case be cheaper and more easily preserved, might if administered in large doses, be substituted with advantage for commercial antistreptococcal serum. McLeod believes that experimental work on the therapy of streptococcal infections which aims at finding some artificial antibody to streptococcal toxin is much more likely to be fruitful than any further efforts to amend and improve the methods of immunizing horses to this type of bacteria.

25. **Electrolytic Prevention of Lead Poisoning.**—Goadby's experiments in vivo and in vitro give no support to the contention that lead is eliminated from the animal body by the electrolytic methods tested; neither do they suggest any grounds for the adoption of electrolytic baths for the prevention or treatment of lead absorption or lead poisoning.

26. **Electrolytic Treatment of Lead Poisoning.**—Oxley claims that no practical good would result from the regular treatment of lead workers by electric baths as described by Sir Thomas Oliver. His experiments show a consistently negative result even under more favorable conditions for lead extraction than can be obtained in the human subject.

Berliner klinische Wochenschrift

September 21, LI, No. 38, pp. 1637-1656

29 *Arteriomesenteric Occlusion of the Duodenum. E. Melchior. Concluded in No. 39.
30 *Supernumerary Kidneys. (Ueber Beinieren.) K. Neckarsulmer.
31 *Silver Nitrate Therapeutically Superior to All Other Silver Salts. (Silbernitrat oder Silbereiweiss.) W. Lublinski.

29. **Arteriomesenteric Occlusion.**—Melchior does not agree with Codman and others who think that the viscera are suspended by their ligaments or mesentery. The very structure of the suspending ligaments or mesentery speaks against this, as any substance intended to stand direct traction always contains strands of tendon fibers, while there is nothing of the kind in the mesentery, and it is absurd to suppose that the hepatogastric ligament, for example, is capable of sustaining the weight of the heavy, filled stomach. The organs in the abdominal cavity either float or rest on the organs below, and these on the floor of the pelvis and the abdominal wall. Attempts to correct the sagging of the viscera by strengthening their alleged supports are illogical and futile. He presents a number of arguments to sustain these views as bearing on the mechanism of the development of acute duodenal ileus or arteriomesenteric occlusion, as it is more generally called.

30. **Supernumerary Kidneys.**—Five cases of a well-formed extra kidney have been published, but without microscopic examination as to whether the supernumerary kidney was an actually functioning organ. Macroscopically they seemed to be such, and their independent location nearer the pelvis seemed to confirm that they were more or less perfect extra kidneys. Cases of a supernumerary rudimentary kidney are comparatively common, and Neckarsulmer reports one he recently encountered in the cadaver of a 9-months-girl baby. This third kidney was adherent to the left kidney but it had its own ureter. Its development had evidently been arrested in an embryonal stage. As its ureter was impermeable, it could never have secreted normally, but there were signs that its tissues had reacted to the measles and pneumonia toxins in the same way as the normal kidneys. These rudimentary organs have always been found clinging to the normal kidney.

31. **Silver Preparations.**—Lublinski admits the unpleasant taste and pain of application when silver nitrate is used on the mucosa of the upper air passages, but declares that all his attempts to find an effectual substitute for it have been fruitless. No other preparation of silver approaches it in therapeutic action, he says. The silver content does not seem to be the effectual factor. It is like salvarsan; the arsenic in salvarsan is not responsible for its efficacy—it is the special combination. Even the smallest dose is more effectual than large amounts of arsenic, and there seems to be something of the same special therapeutic efficacy in silver nitrate. It is true that silver nitrate coagulates the albumin and this has been assumed of late to be a barrier to its penetration into the depths. This has been the stock argument on which manufacturing chemists have based their claims for the superiority of their preparations. Lublinski's research has confirmed that under the action of silver nitrate on the mucosa the albuminate is precipitated. But it must not be forgotten that this precipitate, formed by the albumin under the influence of the silver nitrate, rapidly dissolves again in salt solution, which fact we utilize by gargling with salt solution after cauterization with the silver nitrate. The precipitate deposited then is of a different color, tending to violet, as it consists of silver chlorid. This is not soluble but it is possible that the drawing out of the chlorids from the tissues to make it may have some therapeutic action on the diseased tissues. There is no evidence to show that this silver chlorid precipitate opposes any barrier to penetration into the depths, and, on the other hand, there are many things that testify to penetration and decided action of the silver in the deeper tissues. For example, how otherwise can we explain the after-pain, the pain that is experienced ten or twenty minutes later than the pain of the primary superficial application. He thinks it must be due to the action of the caustic on the deeper tissues. Of course he does not refer to actual cauterization with painful destruction of tissue; this abuse of therapeutics he denounces, saying that it is not in this excessive use of silver nitrate that its therapeutic efficiency is displayed.

Deutsche medizinische Wochenschrift, Berlin

September 17, XL, No. 38, pp. 1753-1768

32 *Cancer Problems. (Krebsprobleme.) D. v. Hansemann.
33 *Diagnosis of Small-Pox. (Blattern.) Risel.
34 *Salvarsan in Scarlet Fever. (Salvarsaninfusionen bei Scharlach.) F. Glaser.
35 *Deep Injections in Treatment of Sciatica. (Injektionsbehandlung der Ischias.) Lethaus.

32. **Cancer Problems.**—Hansemann's article was summarized in the Berlin Letter in THE JOURNAL, Sept. 5, 1914, p. 879.

33. **Diagnosis of Small-Pox.**—Risel states that his article is based almost entirely on Ricketts' work on this subject, published in 1908, and Wanklyn's in 1913. Ricketts had charge of the isolation hospitals in England, in which were treated 7,842 cases of small-pox in 1912, while there has been no opportunity to study small-pox in Germany of late years, as the strict enforcement of the vaccination law of April 8, 1874, stamped out the disease in Germany. He says that the distribution of the eruption seems to be the most important differential feature as it affects the regions exposed to weather and friction from clothes, the soles of the feet, etc., while the eruption in varicella seeks out the most sheltered regions.

34. **Salvarsan in Scarlet Fever.**—Glaser has used salvarsan in forty-two cases of scarlet fever in children and adults, and says that it often had a favorable influence on the fever and delirium and the throat symptoms rapidly subsided under it in many instances. But the toxic symptoms did not seem to be affected by the drug and complications were not warded off. In about half the cases the dose, calculated at 0.01 gm. per kilogram of weight, was followed by a chill, vomiting and diarrhea.

35. **Blocking the Nerve in Treatment of Sciatica.**—Lethaus does not venture to use alcohol to block the sciatic nerve as this is fraught with such danger for a nerve with both motor and sensory fibers. He injects 100 c.c. of a 1 per thousand solution of a mild anesthetic at the point where the sciatic nerve emerges from the great sciatic foramen, between the trochanter and the tuberosity of the ischium. The injection is made into the nerve itself when possible, but often it is merely a perineural injection. It is repeated after an interval of eight days; sometimes three or four injections are necessary to realize a complete cure. No untoward by-effects were observed in any instance in his experience. When repeated injections do not accomplish the purpose, he tries epidural injections, and has sometimes had good results.

For this he injects 10 or 20 c.c. of salt solution into the epidural sac through the sacral hiatus, the patient in the knee-elbow position. Sometimes three or four injections had to be made to cure the sciatica completely. In some cases both these measures failed, and recurrence was sometimes observed. This is not to be wondered at, he says, as persons subject to sciatica are usually those with a predisposition to nerve and joint derangement.

He emphasizes that in treatment of sciatica far too often the real cause is overlooked. This may be flat-foot, varices, tarsalgia, tumor in the pelvis, inflammation in the hip-joint, displacement of or inflammation in the internal genitals, obstinate constipation, disease of the lumbar vertebrae or sacrum, or disease of the spinal cord or its roots or meninges —any of these may simulate sciatica. He warns further that no attempt should be made to block the nerve when the sciatica is the result of some general disease, such as malaria, influenza, nephritis, diabetes, arteriosclerosis, or lead or alcohol poisoning, also the pains liable to occur in the hysteric and neurasthenic which masquerade as sciatica but are really of central origin. Oppenheim's "psychalgias" are likewise not suitable subjects for nerve blocking. But when the above can be excluded, Lethaus advocates prompt resort to injection treatment in chronic sciatica rebellious to other measures. He does not wait longer than from four to six weeks, during which time bed rest, sweat baths, packs of the limb affected, diathermia and the usual antineuralgic and antirheumatic measures are systematically applied.

Medizinische Klinik, Berlin

September 13, X, No. 37, pp. 1461-1480

36 *Acute Overexertion of the Heart in the Field. (Die akute Ueberanstrengung des Herzens im Felde.) K. Brandenburg.
37 *Roentgen-Ray Work in the Field. (Feldröntgenwesen.) H. Strauss.
38 *By-Effects of Drugs. (Nebenwirkungen der Arzneien.) Grumme.
39 Ureter as Content of Hernial Sac. (Ureter als Bruchinhalt.) Pflücker.

September 20, No. 38, pp. 1481-1502

40 *The Diseases that Must Be Reckoned with During War. W. His. Commenced in No. 37.
41 The Surgeon on the Battle Field. A. Köhler. Concluded in No. 39.
42 Care of the Wounded in the Home Zone. (Kriegschirurgie im Heimatlazarett.) E. Heymann. Concluded in No. 39.
43 Hydrotherapy and Mechanotherapy for Wounded and Sick Soldiers. A. Laqueur.
44 Saline Infusion and Proctoclysis. (Die Infusion von physiologischer Kochsalzlösung.) O. Nordmann.

36. **Acute Overexertion of the Heart in the Field.**—Brandenburg comments on the reserve capacity and reserve muscular contractile force of the sound heart which enable it to stand sudden extreme strain without appreciable permanent injury, but the physical, psychic and nervous stress in war may strain the heart beyond its endurance. Extreme muscular exertion has been known to strain even a sound heart beyond its power to endure, as in the Marathon runner and in racehorses. In the collapse on the march known as heat-stroke, the overstrain of the heart is probably a factor superposed on the excitement and exhaustion from inadequate sleep and food. Treatment must include complete physical and mental repose; the patient must be put to bed, his clothes removed, with cold applications to the heart and venes ction if there is venous congestion. The acute dyspnea and collapse require stimulants, brandy or coffee, hot baths and mustard pastes applied to chest and back of neck. An intravenous injection of some preparation of digitalis is often marvelous in its effects; it can be followed by subcutaneous injection of some digitalis preparation plus epinephrin. Even if the patient rapidly recuperates, complete rest should be enforced as long as possible. Signs of dilatation and a persistently rapid pulse call for extreme caution and avoidance of all physical exertion. The prognosis depends mainly on whether the heart was previously sound or not. Syphilis may have impaired the arteries of the left heart, or alcohol or immoderate eating. Men used to carrying heavy weights or other hard manual labor, and drinking much fluid, especially beer, are particularly liable to break down first on the march.

37. **Roentgen Work in the Field.**—Strauss says that to date Roentgen apparatus have been utilized in eight campaigns in the field. The Italians applied them first in their campaign in Abyssinia in 1896, and in the Spanish-American War seventeen sets of Roentgen apparatus were at the disposal of the force. But the ever growing disinclination to operate at the front has shown that Roentgen examination is useful only to disclose conditions in an infected wound or in a wound in the skull—both of these can be done only in the base hospitals or home zone, as rest is necessary after trephining, etc. The German army, he relates, is provided with Roentgen apparatus and camera, dynamo and benzine motor, all mounted in a wagon which four horses can draw over any kind of a road. No attempt was made to use an autotruck for the purpose as snow and bad roads might put it out of commission. Two roentgenologists and a man to run the motor accompany each apparatus.

38. **By-Effects of Drugs.**—Grumme defines the nature of idiosyncrasy, etc., in regard to drugs, recapitulating his views in the statement that the obligatory by-effects of drugs are characteristic for each. They develop gradually and are always alike when sufficient of the drug has been taken to induce the by-effects, and the by-effects can be arrested by suspending the drug. The idiosyncrasy, on the other hand, is a facultative by-effect; it usually comes on rapidly and suddenly, and its course is not under our control by suspending the drug. Iodism, bromism and mercurialism are obligatory by-effects.

40. **Diseases that Must Be Reckoned with During the War.**—"War and Pestilence"—these have always been coupled in popular parlance, His remarks, and with the present war, whose duration and extent no one can foresee, the pestilences of olden days may very soon loom up as a threatening reality. The troops at the front are set back centuries of hygienic training. Hundreds of thousands are crowded together in small spaces without provisions for water, cleanliness or sewerage, and exposed to the vicissitudes of weather. Civilization has given us knowledge of the causes and weapons with which to fight disease and the community has done this for us, but now the individual must take the weapons in his own unskilled hands and wield them himself. By comparison with statistics from recent campaigns, we can expect, he continues, that every second man in the army will be in the hospital sooner or later for a longer or shorter stay. Most of them will require treatment merely for sore feet or digestive disturbance. A somewhat more important rôle will be played by polyarthritis, pneumonia, bronchitis, etc., from getting chilled and overexerted. But the kind and extent of epidemic diseases will determine the fighting capacity of the troops in the long run. All depends on detection and isolation of the first cases, and he reviews each of the chief epidemic diseases in turn, portraying the clinical picture of the incipient stages, and outlining treatment. He pays tribute to the work of the profession in sanifying the Panama Canal Zone. The medical forces there were able to precede and prepare the isthmus for the workmen, but an active army cannot wait for this. In Russia, typhoid, typhus, small-pox and dysentery occur in about the same figures year after year, but cholera seemed to die out in 1913. About 145 cases have been reported already this year and 49 cases of bubonic plague. In India plague keeps up indefinitely, averaging 1,500 cases a week. The danger therefore is from the east. He says of typhoid that the contrast between the severe physical depression and the absence of any pathologic findings in any organs is the most characteristic warning signal; even the spleen does not become enlarged until the end of the first week. Herpes is of rare occurrence. Paratyphoid is seldom transmitted by contact; the incubation period is only from three to six days, and herpes is more common. As differentiation from typhoid is so difficult it is better to isolate as if for typhoid. Manchurian typhus begins suddenly; the spleen is enlarged the first day. The temperature runs up to 104 and keeps there for nine to fourteen days.

Münchener medizinische Wochenschrift, Berlin

September 15, LXI, No. 37, pp. 1929-1960

45 *Action of Ferments Revealed in Histologic Sections. (Nachweis der Wirkung spezifischer Abwehrfermente im histologischen Schnitt.) H. Rollett.

46 Peptolytic Ferments in the Urine. II. W. Sagel.
47 *Luetin in Diagnosis of Syphilis. (Diagnostische Versuche mit Luetin-Noguchi.) M. Clausz.
48 *Prophylaxis of Diphtheria. K. Kassowitz.
49 Inflatable Bulb for Occlusion of Lower Esophagus when there is Danger of Aspiration of Vomit. (Eine Kardiaabschlusssonde.) A. T. Jurasz.
50 Progress in Diagnosis and Treatment of Surgical Tuberculosis. F. König. Commenced in No. 36.
51 The First Wounded Received at Munich. (Die ersten Kriegsverletzungen.) A. Krecke.
52 Arrow-Like Missile Flung from Airship. (Kriegschirurgische Erfahrungen über Pfeile als Wurfgeschosse.) J. Volkmann.
53 Surgical Impressions from the II Balkan Campaign. R. Klapp. Concluded in No. 38.
54 Intravenous Antitoxin Treatment of Traumatic Tetanus. (Wundstarrkrampf.) L. Kirchmayr.

September 22, No. 38, pp. 1961-1992

55 *Fever from Retention of Infected Masses. (Resorptionsfieber oder Retentionsfieber.) A. Hamm.
56 *Origin of Edema with Nephritis. E. Magnus-Alsleben.
57 Colorimetric Determination of Albumin. (Die kolorimetrische Eiweissbestimmung als exakte analytische Methode und ihre Verwendung für Autenrieths Kolorimeter.) M. Claudius.
58 *Sand Test for Bile Pigment and Hemoglobin in the Urine. (Einfache Probe zum Nachweis von Gallenfarbstoff und Hämoglobin im Harn.) H. Lipp.
59 Paratyphoid Simulating Typhoid; Two Cases. W. Glaser.
60 Vaccine Diagnosis and Therapy of Gonorrhea. (Wert intravenöser Arthigoninjektionen bei gonorrhoischen Prozessen.) A. Arnold and H. Hölzel. (Kollargol und Arthigon bei gonorrhoischen Komplikationen.) Renisch.
61 Date and Place of Birth, Instead of Names, to Preserve Secrecy in Notification of Venereal Disease. (Die Anzeigepflicht bei venerischen Krankheiten ist leicht durchführbar.) L. Merk.
62 Treatment of Typhoid. (Unterleibstyphus.) E. Romberg.
63 Differentiation of Dysentery. (Differentialdiagnose der Ruhr gegenüber anderen ähnlichen Darmkrankheiten.) A. Schmidt.
64 *Treatment of Prolapse of the Intestines in the Field. (Darmprolaps im Felde.) F. Riedinger.
65 Circular to be Distributed before Naval Battle. (Sanitätsmerkblatt für das Verhalten im Seegefecht.) M. zur Verth.
66 Ordinary Boiled Water Can Be Used for Saline for Intravenous Infusion in Emergencies. (Kochsalzlösungen.) F. Hercher.
67 Food of Civilian Population during the War. (Die Ernährung der deutschen Zivilbevölkerung im Krieg.) Hecht and Others.

45. **Microscopic Determination of Protective Ferments.**—Rollett left the specimen of serum from a pregnant woman in contact with scraps of placenta tissue for sixteen or twenty-four hours, with a control experiment with normal serum. The scraps of placenta were then embedded, sections made and stained. Under the microscope the sections from the pregnant serum then showed marked differences in the aspect of the specific placenta tissue. The test was positive only when the placenta scraps had not been subjected to pressure or the action of chemicals before the serum was poured over them. Similar tests with cancer serum have proved disappointing to date.

47. **Luetin in Diagnosis of Syphilis.**—Clausz applied luetin in 71 cases of syphilis; 10 suspects and 30 of non-syphilitic affections, comparing the findings with the Wassermann reaction. They show that a positive response is decisive; the luetin findings were sometimes positive when the Wassermann failed to elicit a response with known syphilis. The luetin reaction in the torpid cases may be two weeks in developing.

48. **Prophylaxis of Diphtheria in an Institution.**—Kassowitz has bacteriologic examination made of every person who has been in contact in any way with a case of diphtheria, and repeats it at the end of a week at latest. The persons giving positive findings are at once sent away and the institution is closed until thorough disinfection has been done. The bacilli carriers are given a test intracutaneous injection of toxin and those responding with a positive reaction are treated with antitoxin. All are kept under ambulatory observation, with repeated bacteriologic-serologic control. For local treatment he has found rinsing with 0.5 per cent. solution of hydrogen dioxid the most effectual measure. By these means he stamped out an epidemic in a kindergarten after there had been five cases and eight bacilli carriers were discovered among the fifty-two children. None of the bacilli carriers developed the disease under this treatment.

55. **Retention Fever.**—Hamm insists that the fever which results from retention of infected masses in the organism and which ceases when these masses are cleared out is the only type of "retention fever" which modern science should recognize; the old terms for it, "absorption fever," "putrid intoxication," "sapremia," "saprophytemia," "toxinemia," etc., should be discarded. The term "retention fever" includes all these various conceptions and points the way at once to effectual treatment. Infection and intoxication from bacterial products are always associated; he even goes so far as to assert that from the clinical point of view we may safely assume that there is no infection without intoxication and also no intoxication without infection.

56. **Factors of Edema with Nephritis.**—Alsleben was impressed by the fact that a patient with acute nephritis retained nearly all of a liter of tea while 800 c.c. of saline injected intravenously was nearly all voided in the urine. In another case there was a slight tendency to diffuse edema with contracted kidney. The patient then developed conjunctivitis and while it lasted there was extreme and extensive edema although the eye affection was very mild. As the latter subsided, the edema returned to its old, mild form. In some cases of scarlet-fever nephritis, likewise, water taken by the mouth was retained while fluid injected intravenously was promptly eliminated by the kidneys. These and analogous experiences related confirm, he says, the assumption that partial functions of the kidneys can be disturbed while others are unimpaired, and also that retention in nephritis must depend to a certain extent on factors outside of the kidneys. Inability to eliminate water by the kidneys does not entail dropsy but merely intravascular retention of the water, hydremia. Edema may also occur with intact kidneys.

58. **Sand Test for Bile Pigments and Hemoglobin in the Urine.**—Lipp spreads on a plate a layer of white sand, about 3 cm. thick. On this he pours some of the urine to be examined. If the urine contains pigments, a spot is left on the white sand which is brown with hemoglobin and with a greenish tinge in case of bile pigment. He has found this simple test extremely reliable.

64. **Management of Eventration in the Field.**—Riedinger has been experimenting with rabbits to learn how best to protect prolapsed intestines before the laparotomy is possible. The best results were obtained with liquid petrolatum poured over the exposed bowels; glycerin and vaselin also proved effectual in warding off peritonitis in some of the rabbits.

Zentralblatt für Chirurgie, Leipsic

September 19, XLI, No. 38, pp. 1489-1512

68 *Surgery of the Cavity of the Greater Omentum. (Zur Chirurgie des grossen Netzbeutels.) G. Ziembicki.

68. **Surgery of the Cavity of the Omentum.**—Ziembicki reviews various pathologic conditions in the bursa omentalis which may require operative measures, such as hernia through the foramen of Winslow (twenty cases were on record in 1906); abscess in the liver perforating into the bursa omentalis; accumulation of lymph or of blood from hemorrhagic pancreatitis or rupture of splenic artery; involvement of the region in necrosis of the pancreas; and pseudocysts and invasion by cysts starting in the pancreas. Lymph is liable to accumulate in the bursa omentalis after contusions or other trauma, and it can be safely evacuated. The cavity of the omentum may be entirely filled with the effusion. Elter and Auvray each operated in a case of this kind and found no signs of connection with the pancreas. Still another pathologic condition possible is hernia of the gall-bladder into the cavity of the omentum. Ziembicki operated in a case of this kind, supposing that the tumor felt in the bursa omentalis was a cyst, probably originating in the pancreas. Puncture however brought bile, and the tumor proved to be the much enlarged gall-bladder which had slipped through the foramen of Winslow or some abnormal opening into the cavity of the omentum. The patient was a man of 42 who had complained for five years of pain in the stomach region gradually becoming unbearable during the last year. After draining the dislocated gall-bladder the fistula soon healed and the man has been entirely well since. In conclusion Ziembicki describes what he thinks

is the eighth case on record of a tumor developing primarily in the bursa omentalis. All were cancers, and they were distinguished by their very slow growth and absence of metastasis. His patient was a man of 32 who had had symptoms for four years, ascribed at first to a tumor in the liver.

Zentralblatt für Gynäkologie, Leipsic

September 19, XXXVIII, No. 38, pp. 1249-1264

69 *Scopolamin. J. Fonyo.

69. **Scopolamin in Anesthesia.**—Fonyo thinks that he is justified in drawing the conclusion from his experiences with scopolamin in 154 cases that the scopolamin-morphin technic is not dangerous for vigorous and well-nourished patients. But when a not very strong patient has been purged for an operation and is not allowed or does not wish to eat and is not allowed to drink for fear of bringing on vomiting, the organism feels the effect of the drugs much more intensely. Disturbances are peculiarly liable if there is already some derangement in the respiratory apparatus, as morphin seems to act particularly on the respiration center. One of his patients with cancer of the rectum has been given regularly three times a day for weeks a subcutaneous injection of 0.0006 gm. scopolamin and 0.02 gm. morphin without any disturbance; she is able to eat and is well nourished. An older, demented woman suffering from hunger and thirst, was given a single dose like the above, fractioned, and fell into a deep sleep, and died with signs of paralysis of the respiration in forty-eight hours.

He relates the details further of two fatalities following operative delivery at term with contracted pelvis or extra-uterine pregnancy. Cesarean section was done in one case and pubiotomy in the other. Both succumbed to paralysis of the respiration one hour after the operation which had been done under chloroform preceded by 0.0012 gm. scopolamin and 0.03 gm. morphin. He thinks that the loss of blood and the lack of food as the patients were being prepared for the serious operations were responsible for the unusual toxic virulence of the drugs. He remarks that the mishaps from scopolamin are more numerous since pantopon has been substituted by some for the adjuvant morphin. Voit and others have calculated that during inanition the skin loses up to 97 per cent. of its fat, the liver 70 per cent. and the muscles 64 per cent., but the lipoid content of the brain increases. Consequently the brain is larger in proportion than when the organism is well nourished, and this gives greater play to the toxic action of the drugs.

Gazzetta degli Ospedali e delle Cliniche, Milan

September 17, XXXV, No. 109, pp. 1169-1184

70 *Progressive Pernicious Anemia. (La malattia del Biermer.) E. Cavaglieri.

September 20, No. 110, pp. 1185-1200

71 True Pellagra in Southwestern Russia. G. Tizzoni.

September 24, No. 111, pp. 1201-1216

72 Occlusion from Adherent Mesocolon after Retrocolic Gastro-Enterostomy. G. Baroni.

70. **Biermer's Pernicious Anemia.**—Cavaglieri emphasizes the differences between the morbid entity described by Biermer and progressive pernicious anemia from other causes, and with a relatively different course. The true Biermer anemia develops insidiously, without known cause, but besides the destruction of the blood, pathologic conditions are found in the stomach and intestines, and various other organs show degeneration when the disease has run its inexorably fatal course. It is more common in the middle aged and he has found it more frequent in women. Its comparative rarity in Italy may be due, he remarks, to failure to differentiate it. In a case reported in detail in a woman of 35, extreme weakness and intestinal disturbances were the first symptoms. The intense pallor was in marked contrast to the well-nourished aspect. Bacteriologic examination was negative and no benefit was obtained from a tentative course of quinin. Death occurred in asystole the eighth month after the first signs of trouble. Treatment can be only symptomatic in such cases; remissions sometimes occur spontaneously but he is convinced that the few cases reported as recoveries were probably not true Addison-Biermer pernicious anemia; this is inevitably fatal, generally in from ten to fifteen months.

Brazil Medico, Rio de Janeiro

September 1, XXVIII, No. 33, pp. 317-324

73 Lactose Plus Sodium Citrate in Infant Feeding. (Tratamento da dyspepsia infantil pelo leite adocicado.) A. A. S. Moreira.

74 The History of Parasitology in Brazil. A. C. de Sant Anna. Concluded.

September 8, No. 34, pp. 325-332

75 Strongylidae in Brazil. (Tricostrongylideos brazileiros. III.) L. Travassos.

Russky Vrach, St. Petersburg

XIII, No. 18, pp. 633-668

76 *Management of Delivery with Contracted Pelvis. V. V. Stroganoff.

77 Morphology of Lymphosarcomas. N. V. Petroff.

78 *The Washing of Blood Outside the Body and the Vital Stability of Red Blood-Cells. V. A. Iurevich and W. R. Rosenberg.

79 *Plague among Camels in the Epidemic of Astrakhan Plague. N. N. Klodnitzky.

80 Technic for Examining the Isolated Kidney. M. I. Gramenitzky.

81 *Etiology and Treatment of Dysentery. G. I. Kopitko and V. E. Nagorskaia. Commenced in No. 15.

82 *Saline Infusion. M. V. Sokolova.

83 Coccobacillus Exanthematicus. N. A. Sokalsky.

No. 19, pp. 669-704

84 *Determination of the Viscosity of the Blood. V. S. Sadikoff and A. A. Lozinsky.

85 *The "Uremic Constant" in Nephritis. I. B. Studzinsky.

86 *Cutaneous Tuberculids in Young Children. S. Ostrovsky.

87 *Cholesterin Esters in the Urine in Connection with Deposits of Anisotropic Fat in the Organs. A. V. Lavrinovich.

88 *Hexamethylenamin in Acute Disease of the Lungs. P. I. Mikhailoff.

76. **Management of Contracted Pelvis.**—Stroganoff recommends cesarean section in an absolutely contracted pelvis (true conjugate 6.5 or 5.5 cm), even when the fetus is dead. With a conjugate of 6.5 to 7 cm. he advises either cesarean section, or craniotomy, according as the fetus is alive or dead and the mother is willing to undergo a serious operation. When the true conjugate is 7 or 8 cm., forceps or cesarean section or craniotomy are justified, and, in multiparas, also the history and course of the previous deliveries should be taken into consideration. The same course should be pursued when the true conjugate is 8 cm. or more, though in such cases he advises to wait for natural delivery. Besides the diameter of the conjugate, other circumstances are of importance, the size and shape of the child's head, the size of the pelvis, its ability to stretch, the mother's health, etc. As these factors cannot be as accurately determined as the conjugate diameters, these are still to be considered of paramount importance as the guide to management of labor with contracted pelvis.

78. **Blood Washed and Returned to the Body.**—Iurevich and Rosenberg experimented on rabbits and demonstrated that the blood can be removed from the body, thoroughly washed out and reintroduced into the animal's system without causing any appreciable morbid symptoms. The blood was taken from the carotid artery, drawn into test-tubes containing a 1.5 per cent. solution of sodium citrate to prevent coagulation, and up to one-half of the total amount of the animal's blood was thus withdrawn. It was then centrifuged for about ten minutes; the plasma was removed and replaced with normal salt solution, and the blood was again centrifuged, repeating these procedures three times if necessary. Then the thoroughly centrifuged and washed blood was warmed (to 38 or 40 C.) and injected back into the rabbits, through a vein in the ear. In some they immediately replaced the amount of the withdrawn blood by a corresponding amount of normal salt solution. They found that only a small proportion of the red blood-cells became destroyed, the majority remaining intact, even when the blood was kept outside the body for two or three hours. Thus the stability of the red blood-cells is very great, and in cases of toxemia, when the blood is saturated with toxic substances, blood-letting followed by reintroduction into the vascular system of the blood that had been removed and washed ought to be of great clinical value. Experiments along these lines are now being conducted.

79. **Plague among Camels and Its Etiologic Importance in the Epidemic in Astrakhan.**—Klodnitzky reports numerous facts showing that camels are not immune against plague, but are the chief cause of epidemics of this disease in some parts of southeastern Russia, among the Kirghiz tribes. The camel's meat is used as food by these people, especially when the animal gets sick, and it is thus a frequent cause of epidemics. The skins of camels are used for different purposes; this is another source of the plague. The disease in 1911 and 1913 occurred mostly in the form of winter pulmonic plague, which may be explained by the fact that the camels are butchered early in the winter in great numbers. The marmots (*Mus scitillus*) could not be held responsible for the infection as he says they burrow underground to stay by the end of July, and the epidemic in 1913 began in October and ended in December. There were 400 cases of the pneumonic form.

81. **Etiology and Treatment of Dysentery.**—Amebic dysentery does not occur in Russia except imported cases from tropical countries or in persons infected at home by the imported cases. Emetin proved wonderfully effectual in the cases of amebic dysentery reported here. The other form in which dysentery occurs in Russia is due to the Shiga-Kruse bacillus. The best treatment for this, according to Kopitko, seems to be ipecac in powder form (1 or 0.5 gm. once or twice a day), or Dover's powder (0.3 gm. three times a day) or a combination of ten drops of simple tincture of opium with five drops tincture of ipecac, three times a day.

82. **Saline Infusion.**—Sokolova has had extensive clinical experience with intravenous and subcutaneous injections of normal salt solution in various suppurative diseases, especially those of the peritoneum. Five or six liters of normal salt solution were often injected during the first twenty-four hours after the operation and then smaller amounts for seven or more days. The pulse remains full for a long time, diuresis was increased, and the urine was of low specific gravity, but the wounds were pale, showing poor granulations. At the end of the first week after the operation edema would develop in the feet, hands, skin of the trunk and sometimes of the face. Necropsy would show flabby tissue, especially of the heart, and eventually degeneration of the kidneys. These changes might be ascribed to the infusion or to the original suppurative disease.

To clear up this question Sokolova instituted experiments on normally fed and starving dogs, as patients with purulent peritonitis are in a condition of practical starvation. She made 200 injections intravenously or hypodermically, in amounts totaling one-thirteenth to one-sixth of the body weight. Dogs were kept ten days without food or drink and then the experiment was begun. Four dogs were not starved; these served as controls. It was found that in the starving dogs part of the injected fluid was retained, as the amount of voided urine was smaller than that of the fluid introduced, and edema developed unless the animals succumbed during the first three or four days; the amount of nitrogen excreted was smaller than in non-starving dogs. In the non-starving animals edema never developed, not even after profuse infusions. The edema does not depend so much on loss of nitrogen or phosphorus as on the incomplete elimination of the fluid from the body. The kidneys suffer more than any other organ (static hyperemia). Starving animals succumbed to the saline infusions quicker than the control animals. The practical conclusion is that large amounts of fluid may prove directly injurious for an exhausted body.

84. **Influence of Water, Saline, Etc., on the Viscosity of the Blood.**—Sadikoff and Lozinsky studied the changes in the viscosity of the blood in man, rabbits, sheep, guinea-pigs, cats and pigeons under the influence of water, salt solution, etc. Rabbit blood diluted with normal salt solution does not show any changes in the viscosity but when diluted with ten parts plain water the viscosity increases. In pigeon blood the plasma also shows increased viscosity when diluted with an equal volume of water. The same occurs in man; solutions of human blood with ten parts water, ammonia or normal salt solution give an increased blood viscosity, but saturated ammonia solution increases viscosity less than plain water. The plasma also shows increased viscosity with an isotonic normal salt solution. Hence normal salt solution is by no means an indifferent medium for the red blood-cells, because it increases the viscosity of the blood and causes swelling of the red blood-corpuscles even in weak solutions. Therefore, red blood-cells washed with large quantities of normal salt solution—such as are used for hemolysis experiments—are not normal cells, but artificial products. As the plasma and serum also show viscosity changes, it follows that the albuminoid substances in the plasma must undergo ultramicroscopic changes at least, which changes probably play a part in the phenomena of immunization.

85. **Ambard's "Uremic Constant" in Kidney Disease.**—This mathematical formula for estimating the functional capacity of the kidneys was described in THE JOURNAL, March 7, 1914, p. 813. Studzinsky cautions that the index may vary on account of different factors, such as infectious disease, liver disease, presence in the urine of albumin or sugar. In these conditions the uremic constant is abnormally low, while on the other hand salt-poor food and acute febrile diseases, edema and oliguria increase the index figure. For these and other reasons Studzinsky thinks that the formula is of little clinical value in a large proportion of cases.

86. **Cutaneous Manifestations of Tuberculosis.**—Ostrovsky's experience with two cases of tuberculosis of the skin in children in the Zurich clinic emphasizes the necessity for careful investigation of the skin of small children suspected of tuberculosis. Cutaneous tuberculids are a very important sign of tuberculosis, especially in breast-fed infants. He urges further the universal application of the Pirquet reaction in all children's homes or nurseries.

87. **Cholesterin Esters in the Urine.**—Lavrinovich discusses the presence in the urinary sediment of a peculiar anisotropic fat in the form of cholesterin esters. He examined the urine in 59 cases of kidney disease for the presence of these esters. Among these 59 cases there were 12 of acute nephritis and in none of these could he detect the cholesterin in the urine. In 21 cases of chronic parenchymatous nephritis, cholesterin abounded in the urine, especially when there was concomitant syphilis or tuberculosis. The findings were also positive in 3 cases of amyloid of the kidney and negative in 5 cases of venous congestion of the kidneys. At necropsy in 9 cases he found the same fat deposits in the kidney epithelium, especially in the convoluted tubules, also in the adrenals, aorta, spleen, bone marrow and liver. Such deposits indicate, Lavrinovich thinks, a long standing disease of the parenchyma of the kidneys. The discovery of cholesterin esters in the urine in doubtful cases testifies to chronic parenchymatous nephritis with a bad prognosis. As cholesterin is furnished by the food, it follows that in treatment of nephritis the yolk of eggs, brains, sweet cream and all kinds of fats had better be excluded from the diet, he remarks.

88. **Hexamethylenamin in Bronchitis and Pneumonia.**—Mikhailoff reports very favorable results of treatment of various affections of the air passages (acute purulent bronchitis, croupous pneumonia), with hexamethylenamin in 0.5 gm. doses three times a day. In his eight cases of purulent bronchitis improvement was evident in about one and one-half weeks to two weeks, with less cough, reduced output of sputum and speedy disappearance of the fetid odor, and gradual, sometimes immediate decline of the temperature. In thirty cases of croupous pneumonia, 10 per cent. of the patients died, a mortality of about the same as with other methods of treatment. No by-effects were noticed; complications, sweats, or heart weakness were rare, and the average stay in the hospital was shortened by twelve days. He thinks that this drug can be used freely in treatment of lung diseases, being a safe and a theoretically justified remedy.

St. Petersburger medizinische Zeitschrift

August, XXXIX, No. 15, pp. 185-196

89 *Operative Measures in Acute Nephritis. R. v. Kügelgen.

89. **Operative Measures in Acute Nephritis.**—Kügelgen comments on the conflicting opinions as to the advantages of

decapsulation or nephrotomy in relief of acute nephritis. A question-blank circulated in Germany two years ago showed nine authorities in favor and eight decidedly against it. He regards nephrotomy or decapsulation as indicated in acute toxic nephritis, as after scarlet fever or in eclampsia, when it is impossible to put an end to the anuria in any other way. Also in acute infectious nephritis with suppuration, suggested by pain in the kidney, rigidity of that side of the abdominal wall, extreme tenderness of the swollen kidney, and severe general symptoms. In a case reported in detail a man of 51 had always been apparently healthy until he suddenly developed signs of acute nephritis; intense pain in the right kidney region came on in the night and radiated to the right costal arch, abdomen and penis. The last urine had been dark and turbid and this was followed by anuria for thirty hours, with extreme tenesmus. At the attempt to palpate the kidney, the pain started up anew, spreading to the bladder. Roentgenoscopy showed a small whitish spot above the tenth rib suggesting a possible calculus in the kidney, but none was found at the operation which was done at once. As it proved difficult to reach the kidney, the twelfth rib was resected and the kidney brought up. The surface was very pale but after slitting and loosening up the capsule the kidney became hyperemic. The left kidney was then exposed, and was found very small and studded with cysts and cheesy foci. The capsule was incised and the wound sutured. Prompt recovery followed, illustrating anew the remarkable benefit liable from such operative measures in acute nephritis.

The operation had been undertaken on a mistaken diagnosis as there had been nothing in the case to suggest that the left kidney was pathologic. In reality the anuria was undoubtedly a reflex phenomenon from this chronically pathologic left kidney. It had not been possible to obtain any urine for examination. The operation cleared up the case at once, revealing the large, entirely anemic kidney on the right side, free from calculi, while its mate was completely degenerated and absolutely non-functioning. The ischemic kidney recuperated at once after the decapsulation and slitting, resuming its functioning within a few hours. The success of the operation was thus due exclusively to the relief from pressure. In conclusion he cites from the literature nearly a dozen analogous cases, all emphasizing the great value of decapsulation or nephrotomy in acute nephritis with anuria or uremic symptoms, and even in chronic nephritis when there are uncontrollable uremic symptoms.

Hygiea, Stockholm

LXXVI, No. 14, pp. 801-864

90 *Hydatidiform Mole with Ovarian Cysts. (Bidrag till frågan om mola hydatidosa och samtidiga luteincystor i ovarierna.) F. Westermark.

91 *Arthrodesis of the Shoulder to Correct Deltoid Paralysis; Nine Cases. G. Asplund.

No. 15, pp. 865-912

92 *Improved Technic for Induced Artificial Pneumothorax. (En ny metod att avlägsna adherenser vid pneumothoraxbehandling av lungtuberkulos.) H. C. Jacobæus and H. Tideström.

No. 16, pp. 913-959

93 Fat in the Liver in Chronic Alcoholism. G. Engstrand.

94 Military Surgery in Sweden in the Eighteenth Century. G. Naumann.

90. **Hydatidiform Mole with Ovarian Cysts.**—Westermark reports two cases of this combination. In one the ovarian tumor was operated on two months after expulsion of the mole, but the ovarian trouble may have preceded the development of the mole. In the second case the ovarian tumor was removed without knowledge of the mole in the uterus and it was spontaneously expelled not long afterward. In both cases torsion of the cystic ovary was the immediate cause for the operation, and both patients were dismissed in good condition. Both ovaries were studded with large cysts but the least pathologic ovary was left in its place, after excision or puncture of the cysts, and one of the women was delivered of a healthy child a year and a half later. This patient was an unmarried girl of 16 who had menstruated regularly until the last eight months, following a single intercourse. The uterine hemorrhages returned every two weeks and were extremely irregular and accompanied with pains. Finally scraps of a mole were expelled with about a liter of blood and the whole mole was then delivered by expression after dilatation with an inflatable bag. Two months later she returned on account of symptoms from torsion of the cystic left ovary which was removed. The right ovary was twice the usual size and contained several cysts. There was secretion and considerable flow of milk from the breasts after expulsion of the mole, and the lactation kept up for more than six weeks.

In the second case the woman of 25 had borne a child four and a half years before. Menstruation had been regular until the last four months, and during the last two there had been almost constant uterine hemorrhage and occasional morning vomiting. Pregnancy plus torsion of a cystic ovary was the diagnosis. The ovary in question was resected and the cysts in the other were punctured. Two days later a large mole was expelled spontaneously and some scraps in the uterus had to be cleared out later. A month after expulsion of the mole the woman had epileptiform seizures—for the first time in her life.

There were thirty-eight seizures the first day and fourteen the next, with somnolency in the intervals. Under lumbar puncture, venesection, prolonged baths, morphin, chloroform, scopolamin, chloral and atropin, the tendency to convulsions was brought under control so that there were no further attacks, but artificial respiration was required for twenty minutes the second day as the patient collapsed during a bath at 33 C. The third day the patient was much agitated, with hallucinations; this condition persisted for six days, after which normal conditions were rapidly restored; the ovary that had been left rapidly returned to normal size. Westermark emphasizes the lesson from these cases as to the harmlessness of cysts in the ovaries in connection with a hydatidiform mole. He regards the cysts as the primary trouble, responsible for the development of the mole, but claims that after the mole has been expelled the cysts retrogress.

91. **Arthrodesis in Treatment of Paralysis of the Shoulder.**—Asplund gives an illustrated description of nine cases in which he restored more or less satisfactory function to the shoulder by inducing arthrodesis by fixation of the head of the humerus to the glenoid fossa, the acromion and coracoid process, after thoroughly freshening all the bony surfaces. The children were between 4 and 11 but the best results were obtained in the older children, as the after-treatment is easier with such. For those under 8 he advises immobilization for six or nine months. The more the paralysis is restricted to the deltoid region the better the functional outcome. Bony union was not realized in any of his cases. The paralysis in all was a relic of epidemic poliomyelitis.

92. **To Get Rid of Adhesions Interfering with Artificial Pneumothorax.**—Jacobæus and Tideström have been improving the technic for direct visual inspection of the interior of the chest and abdomen, so that now the pleural cavity can be thus inspected under local anesthesia, they say, without the least discomfort to the patient. They even found it possible to resect part of a tumor in the pleura after thus locating and inspecting it. A small actual cautery has been devised for minor operations in the pleural cavity under this technic, and with it they have succeeded in severing cord-like pleuritic adhesions which otherwise would have completely prevented effectual compression of the diseased lung under artificial pneumothorax. By thus severing one coarse band they succeeded in producing conditions favorable for inducing pneumothorax in a young woman with a large cavity in one lung. The prompt therapeutic effect of the artificial pneumothorax was remarkable, the general health rapidly improving as the output of sputum became reduced. It had previously been profuse, containing numerous tubercle bacilli, but ceased almost completely after the inflation. In two other cases also reported in detail similar minor intrapleural operations were done—all without discomfort or the slightest by-effects or danger, according to their account. Roentgenograms are given of the first case both before and after the adhesion had been severed with the cautery.